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## CONTENTS

| | | |
|---|---|---|
| REPORT FROM GREECE | Lt Col. F. H. Loomis, *Inf* | 3 |
| THE NATURE OF TOTAL WAR | Lt. Col. K. Eklund, *CE* | 10 |
| THE BATTLE OF MILNE BAY | Samuel Milner | 18 |
| THE MILITARY STUDENT | Lt. Col. O. Z. Tyler, Jr., *Inf* | 30 |
| MOVEMENT CONTROL IN A THEATER OF OPERATIONS | Maj. C. E. Rochford, *TC* | 35 |
| HOW FAR ALONG ARE WE IN DEVELOPING AN AIRBORNE ARMY? | Lt. Col. W. A. Kuhn, *Inf* | 41 |
| DEVELOPMENT OF THE VICTORY PROGRAM OF 1941 | Mark S. Watson | 51 |
| MILITARY NOTES AROUND THE WORLD | | 63 |
| FOREIGN MILITARY DIGESTS | | 73 |
| *The Future of Naval Air* | | 73 |
| *Defense in Atomic Warfare* | | 79 |
| *Discipline and Education* | | 84 |
| *The Middle East* | | 87 |
| *Communism and the Resistance Movement* | | 90 |
| *Air Security of Troops* | | 94 |
| *The Engineer in Land Warfare* | | 99 |
| *Bacteriological Warfare* | | 106 |
| BOOKS FOR THE MILITARY READER | | 111 |

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# REPORT FROM GREECE

Lieutenant Colonel Frederick H. Loomis, *Infantry*
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IN MARCH 1947, the Greek Government appealed to the United States for assistance in recovering from four invasions, lengthy enemy occupation, widespread systematic destruction, and the chaos which followed the cessation of World War II hostilities.

The dislocation of the Greek economy as a result of the War was further compounded by violent guerrilla warfare, which threatened to destroy the integrity of the Greek nation and to bring Greece into the Soviet sphere of influence as another communist satellite country.

Recognizing the importance of an independent Greece, the United States heeded this appeal for aid in restoring internal order and a more stable economy. Consequently, on 22 May 1947, Congress passed Public Law 75 authorizing $300,000,000 for Greece in the form of military and economic aid.

The effort is now bearing fruit. The Greeks are not entirely free from guerrilla threat, but they are well on the way towards such freedom. No longer are there huge hordes of refugees concentrated in overcrowded villages. The refugees are returning to the homes and fields from which they were previously driven by guerrillas who were receiving open aid from nations on Greece's northern borders.

Greece is a very old country. Its history dates back at least 2,700 years and perhaps more, but many of its earlier records were destroyed in the Alexandria library fire in Egypt centuries ago. The Greeks gave the world the basis for architecture, mathematics, and medicine. But the country is interesting for other reasons.

The geographic position of Greece makes this ancient battleground of East and West a highly significant strategic area today. Lying in the northeast quadrant of the Mediterranean, the Greek mainland and islands flank the Dardanelles and give the area strategic control over the sea lanes connecting the Mediterranean and Black Seas. Moreover, the position of Greece, particularly the island of Crete, is such as to give the area partial control over the sea routes connecting the Western Mediterranean and the Suez Canal. Also important, strategically, is the port of Salonika, the southern terminus of the historic military corridor leading from the Danubian plain through the mountains to the Mediterranean Sea. Finally, Thrace, the eastward extension of the Greek mainland, serves as a land route to the Dardanelles and Asia Minor.

Greece has about the same area as New

***With American military and economic aid, peace is returning to Greece. At the same time, the sea lanes of the Eastern Mediterranean are being made secure for world commerce in this historically strategic area***

York State. Eighty percent of this area is mountainous, lending itself only to grazing for sheep and goats. The valleys are fertile, and wheat, olives, fruits, and nuts are grown. Because of the few fertile areas, Greece is only 65 percent self-supporting. The chief exports are olive oil and tobacco. The population is 7,400,000, of which 1,700,000 are living in the vicinity of Athens, Piræus, and Kafissia. Raw materials and manufacturing facilities are very limited.

Greece. therefore, does not possess population, food, raw materials, or manufacturing resources of great strategic value. But within the larger dimensions of military strategy, the country derives its significance from its position astride the most important route through the Balkans.

The Pindus Mountains, which are the southern terminus of the Alps, extend southeastward for 160 miles from the Albanian-Yugoslavian border to the Gulf of Corinth. This mass, varying from 40 to 60 miles wide, constitutes an effective barrier to East-West communication. The summits are rounded and bare, the maximum altitude being more than 7,500 feet. Prior to the summer of 1949, the Pindus had only one road across it. This connected Kalabaka and Ioannina in the central portion of Greece. During the summer of 1949, a second road was completed connecting Lamia and the Sperkhios Valley.

Contributing to the strategic potential of the country is the highly indented coastline which may be utilized for basing and operating small naval craft. Moreover, the scattered intermontane lowlands of the country afford a good opportunity for air operations, which are also facilitated by the high incidence of clear skies throughout the year.

Besides the above mentioned roads, there is one good road leading from Athens which runs to Kozane, where it forks, the west road going to Kastoria and Florina, and the east road to Salonika. There are no other roads worthy of mention. The streams of Greece are not navigable and the railroads are very poor and cannot be relied upon for transport of military supplies except for short distances. Supplies are primarily transported by truck and mule pack.

The climate of Greece varies within short distances throughout the country because of the irregularities in terrain and the differences in elevation, latitude, and position with respect to water bodies. The lowlands of central and southern Greece are characterized by hot summers, mild winter, moderate to heavy precipitation in winter, and little rainfall in summer. Northern Thessaly, Macedonia, and Thrace have hot summers, mild to cool winters, and moderate precipitation at all seasons. The interior highlands of Greece have a warm to cool summer, very cold winters, and heavy to moderate precipitation with winter maximum. Temperatures vary throughout Greece from 111° F to 56° F in the summer and from 70° to —30° F in the winter.

In order to assist Greek economy, the American Mission for Aid to Greece (AMAG) was organized. The authorized United States Army strength in Greece on 1 July 1949 was 366 officers and enlisted men. However, because of the successes gained throughout 1949, this figure is being drastically reduced. The director of the advisory and planning group, Lieutenant General James A. Van Fleet, renders advice and guidance to the Greek General Staff on the over-all strategic and tactical planning of operations against the guerrillas. He is directly responsible to the Chief of AMAG, Ambassador Henry F. Grady, but is authorized direct contact with the Chief of Staff, United States Army, on purely military matters. The United States Army Group Greece (USAGG) is also commanded by General Van Fleet and has the mission of supervising and assisting the Greek Army in the

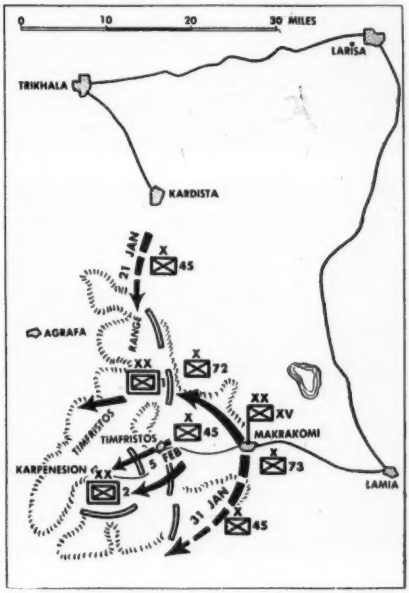
receipt and distribution of supplies and training in the use of various items of equipment.

Major General Reuben E. Jenkins is Chief of the Joint United States Military Aid and Planning Group (JUSMAPG), which is part of USAGG.

The JUSMAPG detachments are composed of American military personnel and vary in size from 16 officers and enlisted

men stationed with a Greek corps headquarters to 8 officers and men stationed with a Greek division.

As the JUSMAPG title implies, these detachments work with their corresponding Greek headquarters in an advisory capacity. A division detachment is generally composed of the following personnel: A lieutenant colonel is the detachment chief; he commands the detachment and works directly with a Greek division commander. It is the detachment chief's duty to advise the division commander and to supervise the use and expenditure of supplies and equipment. The detachment chief is assisted by a major, G-3; a captain, G-4; and a captain, training officer. The training officer trains Greek troops in tactics as well as in the use of American weapons. He is assisted by a Greek demonstration platoon. The remaining personnel in a division detachment is 4 enlisted men—2 clerks and 2 radio operators. The Greek Army furnishes each American officer with an officer who acts as his interpreter. There are no United States combat troops in Greece, and United States military personnel do not participate in combat nor do they command Greek troops. However, they do accompany Greek units engaged in attacking the guerrilla concentrations in order to be able to provide intelligent and timely advice to Greek commanders and staff officers. Three US officers have been killed and one wounded in the performance of this duty.




Greece has approximately 250,000 men under arms at the present time. The guerrilla forces in Greece (called Bandits

One of the outstanding operations to clear Greece of Bandit forces was the action in which the Greek National Army recaptured Karpenesion in the Timfristos Mountains on 8 February 1949. Above, Greek soldiers clearing the supply road of the XV Mountain Division over the mountains. Left, attack of a Bandit position near Karpenesion; the town lies in the smoke in the middle-left of the picture. Lower left, Greek soldiers employ a Bren gun on the summit of the mountains. Lower right, when the Bandits scattered after their defeat, the Government forces organized small forces such as this to track them down.—Photos by author.

Bandit forces in Greece lost nearly 5,000 troops and vast stores of equipment and food in the battle for Karpenesion in early 1949. Left above, a group of Bandit prisoners; the two men on the ground are wounded. Right above, three wounded women Bandit prisoners waiting to be interrogated. Right, two typical Bandit pillboxes which were captured by the government forces near Karpenesion. Lower left, a 75-mm recoilless rifle packed on a mule for use in pursuit of Bandits in the Agrafa mountain area. Lower right, Greek soldiers being trained in the use of the Bazooka, July 1949.—Photos by author.

by Americans there), during the period from late in 1947 to the middle of 1949, remained fairly constant at 25,000 due primarily to their forceable recruiting tactics. The Bandits forcibly recruited each time they captured a village. Because of the successful actions of the Greek National Army during the summer of 1949, it is estimated that there are only 2,000 Bandits now in Greece.

The Greek people are appreciative of the help that the United States is giving them, and Americans are accepted and treated hospitably throughout the entire country. The nation, at the present time, is poor primarily because she has been at war continuously since 1940. A soldier receives his rations, clothes, and $4.50 per month.

The Greek Army is well led, and the senior officers are experienced in tactics. Many are not only graduates of the Greek National War Academy but also graduates of the French War College. The Greek soldier is sturdy and a very good fighter when properly trained. He is capable of walking for days through mountainous areas, living only on bread and water if necessary. However, the ration he receives is nourishing and palatable, although the menu may not be varied. Equipment and weapons are gradually being changed from British to American.

A JUSMAPG detachment remains with the Greek headquarters to which assigned. It moves with and when the Greek headquarters moves, and its members live under the same conditions whether in the open, under tents, or in buildings. Although much time is spent in combat areas, Americans are forbidden to carry arms or to take part in the fighting other than in an advisory capacity.

The basic principles of war remain the same in this extremely mountainous area. However, the tactics used are dictated primarily by the terrain, the weather, and the forces available.

In order to make this point clear, one of the outstanding operations by the XV Mountain Division has been selected as an example. Selection of this example, however, does not indicate either approval or disapproval of the solution.

On 17 January 1949, the Bandit 1st and 2d Divisions, 3,300 strong, attacked and took the town of Karpenesion, which normally has a population of 20,000. The town was defended with one light infantry battalion of 500 men. The Bandit 1st Division took and held Timfristos Range, thus blocking the only avenue of approach into Karpenesion.

Simultaneously, the Bandit 2d Division attacked and took the town after 24 hours of vicious fighting. All efforts to reinforce the garrison with the 72d Independent Brigade were repelled by the 1st Division. The Greek XV Mountain Division was stationed in Trikhala at this time; it was ordered to retake Karpenesion by attacking and destroying the Bandit 1st and 2d Divisions. No boundaries were imposed by higher headquarters, and if necessary, the XV Division could use all Greece as long as the Bandit 1st and 2d Divisions were destroyed.

The XV Division Commander's plan was generally as follows: The 45th Brigade was to move by foot across the Agrafa mountain area from Kardista and attack the left or north flank of the Bandit 1st Division. The 73d Brigade, plus Division Headquarters, would move by truck to Makrakomi, where the Division Headquarters would be set up. The 3d Brigade of the Division would remain in Trikhala and protect that area. The 73d Brigade was to attack west from Makrakomi and north of the Karpenesion road, so as to relieve the 72d Independent Brigade, which would become the Division Reserve after it was passed through. In this way, the 45th Brigade and 73d Brigade would join forces in the vicinity of the Timfristos Mountains, thus giving the division two bri-

gades abreast in the attack against Karpenesion.

On 24 January, the 73d Brigade launched its attack, because the 45th Brigade was within 3 hours marching time of the Bandit 2d Division's north flank on the night of 23 January and theoretically could make contact by 1000 on the morning of 24 January. The 73d Brigade passed through the 72d Brigade and made good progress, but by 1100 hours it had not made contact with the 45th Brigade.

After some investigation, it was learned that "B" Corps in Larisa had, on the night of the 23d, ordered the 45th Brigade to return to Kardista because of a report that 20 percent of the 45th Brigade was suffering from frostbite. (Actually, there were 20 cases, not 20 percent.) The XV Division had not been informed of this action by "B" Corps, and consequently all plans had to be revised.

Between 24 and 31 January, the 73d Brigade, acting alone, made slight gains. During this time, the 45th Brigade regrouped in Kardista and was moved by truck to the vicinity of Makrakomi where it was ordered to envelop the Bandit south flank. After advancing across country for 2 days through 3 feet of snow, the 45th Brigade came to a steep unmapped ravine, 1,500 feet deep. This obstacle could not be passed. So, the 45th Brigade was ordered to return to an area in the vicinity of Timfristos Village. It was ordered to attack generally astride the Karpenesion road and retake Karpenesion, while the 73d Brigade continued attacking in the north.

Between 2 and 4 February, it snowed an additional 2½ feet in the valleys. Reports reached the XV Division Headquarters that there were drifts of 26 feet in the mountains. Later, this figure was confirmed. Meanwhile, the number of frostbite cases was increasing and dysentery and snow blindness were taking their toll. Many mules had slipped off the narrow steep trails and were killed. Consequently, great quantities of supplies had to be handcarried. It became increasingly difficult to move the 81-mm mortars, let alone the 75-mm mountain guns.

However, on 5 February, the attack was resumed. The fighting was vicious and it seemed as though reserve forces would have to be used before the Bandits could be shoved back. This was not necessary, however, as the 504th Battalion of the 45th Brigade succeeded in penetrating the Bandits' lines and forced them to withdraw. The Bandits fought a stubborn, costly, delaying action, but at 1430 on 8 February the leading elements of the 45th Brigade retook Karpenesion and drove the Bandits to the south. The people of Karpenesion were jubilant over the victory of the XV Division. They had undergone almost indescribable atrocities during the Bandit occupation. About 1,100 natives had been forcibly recruited, and the village had been stripped of all supplies.

The XV Division continued the pursuit of the remnants of the Bandit 1st and 2d Divisions. As the Bandits broke into small forces to survive and to evade the XV Division, the latter organized small groups to work out of centrally located areas from which they could follow and destroy the Bandits. All areas were blocked off. There was no escape, and on 15 June 1949 it was announced that the Bandit 1st and 2d Divisions had been destroyed. The Bandits lost nearly 5,000 troops in this action, plus vast stores. The XV Division losses were not great.

# The Nature of Total War

Lieutenant Colonel Karl Eklund, *Corps of Engineers*
Instructor, Command and General Staff College

## Historical Background

IF WE look back through the pages of history, we find that total war is not wholly new. In the distant past, we find that clashes in which the collective effort of one entire clan totally destroyed another entire clan were the order of the day. This was total war in its most basic concept.

As civilization evolved from this society of clans, we find that wars became tribal, sectional, parochial, and finally nationalistic in scope. We find, too, in the more recent past, that wars were a direct result of religious, and then of national, fanaticism. As a result of the "Sport-of-Kings" type of war, which prevailed in the transition period between religious and national fanaticism, we find the evolution of a large body of public and international law for regularizing the conduct of war between nations. This body of law provided a basis for transition from war to peace.

While progress has been great in the development of these rules of conduct, they have been far outdistanced by portentous technological and psychological advances in the actual prosecution of war, which itself has become intercontinental in scope. This great increase in material "know-how," not at all controlled by corresponding increases in moral "know-how," now dominates.

## The Concept of Total War

The concept of total war, although as old as war itself, has been a dormant concept until modern times. Somewhere in the evolution of civilization, an inability to simultaneously control the political, social, economic, and military aspects of life was undoubtedly responsible for the eclipse of the total wars of the clan society. Throughout the evolution of civilization, however, the stakes which have been at issue in all human conflicts have become increasingly more compelling. This has made it increasingly more important that there be a concentration of effort on the winning of wars and hence on the utilization of every potential resource to that end.

The concept of total war, accordingly, is the concept of using every potential resource, of whatever kind, to the single-minded purpose of thwarting the enemy's military, political, social, and economic intentions. Thus, today, total war is once again possible because, in spite of their complexities, political, social, and economic resources are now subjected to a degree of control adequate to permit their utilization as weapons of war.

## The Three Phases of War

War, as we know it today, generally passes through three successive phases, if it runs its full course to totality. The first phase is generally termed "cold war"; the second might be termed "blitz war"; and the third "all-out" war. All three of these phases have been in evidence throughout history, although little emphasis was placed on the methods of cold war prior to modern times.

### *Cold War*

A cold war basically is an attack which has as its purposes the attainment of war objectives without recourse to open military warfare. It utilizes all available nonmilitary weapons including the diplomatic, the economic, and the psychological. The natural tactics of a cold war are the denial of all types of resources to an enemy and the undermining of his will to retaliate. Along with these tactics is the implied threat that military warfare is probable if the enemy adopts strong retaliatory measures.

In diplomatic warfare, the offensive objective is the attainment of a close alliance of nations in support of the viewpoint of the attacker, while the defensive objective normally is a successful counteralliance. In economic warfare, the objectives are to ensure sufficient material resources for one's own needs while denying them to the enemy, and to impose on the enemy a necessity for maintenance of such a high state-of-readiness for a shooting war, or of such a costly series of countermeasures, as to precipitate a financial crisis. In psychological warfare, the objectives are attained through propaganda and ideological machinations directed at the alienation of enemy citizens from their government, and the alienation of the enemy government from other governments that might be friendly to it.

The most potent weapon of cold war—psychological in nature—is an alternation of threat (of war) and promise (of peace) to create a central core of fear and vacillation, embracing the gamut of rumor, suspicion, slander, hypnosis, and mass delusion. This promise of peace, never stated in its true light as "peace-on-our-terms," is an especially potent weapon when its use is continued after the nation under attack has been thrown off balance by ideological machinations.

In the attainment of these objectives of a cold war, it can be expected that enemy agents will use every device conceivable. These devices may include becoming citizens of the nation to be attacked and endeavoring to secure government positions of power, both civil and military, through which direct assistance can be rendered. This, of course, means that surreptitious preparations can be made over a period of years, patiently and inexorably toward the day when over-all conditions are more favorable to open procedures. Simultaneous with this infiltration of the government, similar infiltrations are made with respect to labor unions, educational systems, and research institutions. An attempt is made to influence public opinion, and to undermine the industrial facilities which are critical to the national economy. These acts are, of course, the collective characteristic of a fifth column, and they continue even though the cold war phase may be left behind.

***Although dormant until modern times, the concept of total war dates from antiquity. It contemplates the use of all potential resources to thwart an enemy's military, political, social, and economic intentions***

A cold war is particularly well suited to the offensive, specifically because it can be conducted on a shoestring, relatively speaking. Countermeasures may prove to be too-little or too-late, unless they constitute a determined reaction to the aggressor's threats and a willing acceptance of subsequent heavy financial costs and the attendant risks of real war. A cold war, however, has an inherent disadvantage in that individuals undergoing the same threats and trials tend toward collective

thinking, and this in turn may well result in collective action. Thus, a cold war tends to unify the peoples against whom it is directed. It is quite possible, however, for a cold war to be successful before such unification can become effective. By first gaining vital diplomatic and economic objectives, an aggressor may confront his victim with a situation that would virtually assure his defeat in a shooting war.

Since the advent of war crimes trials at the end of World War II, an additional objective of cold war is apparent. This objective is the conditioning of favorable world opinion. Since cold war may evolve into a full-scale all-out war, the question of responsibility becomes most important. A current example is the determined efforts of one dominant world power and its fellow travelers to absolve themselves of any such blame and to fix that responsibility elsewhere—on the United States, in particular. Coupled with this attempt is the clear effort of that power to insulate its own people, and those under its influence, from the "opposition" viewpoint.

Although a cold war has many facets, its fundamental tactic is the little-by-little attainment of desired ends behind a screen of alternate threats and promises. Valid promises to desist are made only when countermeasures become too strong.

### *Blitz War*

A blitz war is nothing more than an aggressor's initial attempt to utilize his military forces in such predominant strength and with such overpowering speed as to win a war in the opening engagement of military warfare. Historically, this method has been based on new weapons—primarily those of mobility—or on new conceptions of tactics or methods. At the present time, should the current cold war expand to military warfare, it would appear that the blitz would be premised on the airplane or the guided missile, each being a high-speed long-range carrier of agents of great destructive power.

This is not to say, however, that diplomatic, economic, and psychological warfare play no part in blitz war. They are overshadowed by military warfare, but they resume front-rank prominence during all-out war. They are deserving of no small measure of credit for any success of the military blitz, which itself makes every effort to exploit weaknesses developed during a cold war.

### *All-Out War*

All-out war is resorted to only if the blitz fails. All-out war is a slugging match of mass proportions in which the full potential of each participant is developed and brought to bear against the opponent. It is here that the connotation "total" takes on its greatest meaning and during which there is not a single aspect of human enterprise which is not affected. The concept of total war is but the ultimate in the development of all-out war.

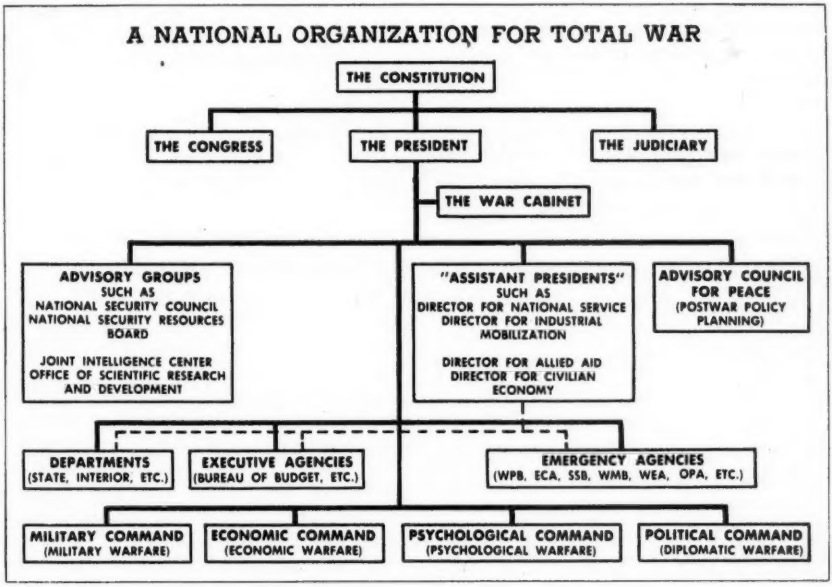
### The Impact of Total War

The complete marshalling of the nation's potential to wage military, political, economic, and psychological warfare simultaneously requires a specifically concentrated effort. This effort has its effect on both the national and the individual level. In a democratic nation, the impact on the individual is great because many personal liberties are lost, virtually in direct proportion to the totality of the national effort. Due to this loss of freedom and the resulting regimentation, the problem of morale on the homefront becomes extremely important. Should there be actual attacks on the homefront, this importance is intensified. The homefront aspects of all types of warfare—military for home defense, political for governmental stability, economic for economic sufficiency, and psychological for social and ideologi-

cal integrity—are intensified during an all-out war. In each of these homefront aspects, an enemy invasion must be thwarted or expelled, and a corresponding but successful invasion of enemy territory must be executed.

The term "regimentation" has a distasteful connotation in the United States. It is so distasteful that certain individuals shy away from it to the extent that they play into enemy hands by joining the ranks of those whose objective, bluntly, is attainment of peace at any price. Nevertheless, should war come again to the United States, a totality of effort far in excess of that which supported World Wars I and II will be required. Regimentation of the individual will also be required, although it will be done under plans approved and supported by elected representatives, and under authorities strictly and resolutely guarded by those same elected representatives.

Individual regimentation would no doubt include the freezing of all jobs, and the freezing-out of jobs not connected directly with the war effort. Job transfers would become difficult, except to jobs bearing a higher-priority relation to the national effort. Incomes from all jobs would be controlled and limited by heavy taxation, and, perhaps, by forced savings. Living standards would decline, housing would become scarce due to population shifts; there would be strict rationing of civilian-type goods and such items as electricity and gasoline. Gasoline rationing in all probability would force pleasure automobiles from the streets. The prospect for the civilian would be a definite decline in real income, a positive loss of freedom to work where and when he chooses, and a



restriction on how and where he would take his vacations.

The complete mobilization of United States industry would require virtually airtight controls over supplies, prices, labor, wages, salaries, and profits. This would mean materials-control through a system of priorities and allocations, price control on everything starting with a price freeze on M-day, a labor draft or allocation system directed at preventing any rise in personal incomes, and a total tax on excess war profits. Labor control measures would undoubtedly incorporate no-strike provisions and compulsory arbitration of disputes.

It is an interesting point worth mentioning, because it exemplifies the effect of total war, that, as a nation's war effort becomes more and more total, more and more of its citizens would literally don a citizen's uniform. This would come about as an unplanned virtue of economy in the clothing industry, an economy resulting from a standardization of output and a sharp reduction in styles and varieties. The ultimate in this respect would be a single style and a single pattern—an *ipso facto* citizen's uniform. This standardization of outer appearance would be only too indicative of the complete regimentation of industry which total war would impose. It would serve as a constant reminder to the Congress to resolutely control the war powers of the national high command and thus to obviate any permanent danger to democratic processes.

On the national scale, total war would mean a staggering cost. World War II at its peak cost $90 billion a year. This is equivalent to $140 billion a year at 1950 prices. This, in turn, is equivalent to $1,000 per capita, per year. A new world war, inevitably more total in nature, would cost considerably more. World War II increased our national debt by $220 billion; World War III could well increase it by $500 billion. Interest charges would then become terrifyingly high, and the burdens of postwar relief might bring about drastic changes in our money value as well as in our form of government. Our present 60-cent dollar could fall to a 10-cent dollar, and devaluation of our currency or repudiation of our national debt might then be our choice. Total war, in other words, could be so costly as to bring national ruin to the victor nation.

This single factor complicates any approach to a solution to the problems of a cold war. It forces an overtone of caution toward all approaches which might convert a cold war to an all-out war. This factor, while a deterrent to both sides during a cold war, tends to favor offensive cold war over defensive cold war.

### Organization for Total War

In any endeavor in which there is a single-minded purpose, there must be single-minded direction and integration of effort. This does not imply direction by a single mind, but it does imply successful direction with organization, knowledge, authority, advice, and command channels in all spheres of activity. Leadership in parochial war was simply a problem of equipping the troops and then literally leading them into battle. Leadership in total war involves integration of the entire national effort, as well as integration of an international effort. For this, there is required a national high command to give over-all direction to the national military, economic, political, and psychological effort. This high command must be appropriately advised, and it must be clothed in suitable authority stemming from and controlled by the national Congress. This element of control is essential, for without it there is danger of permanent abrogation of democratic processes. This control must therefore be resolutely exercised by the Congress and made an in-

tegral part of national war plans. In addition, no war is ever won unless the peace which follows is also won. Hence, postwar policy planning must go hand-in-hand with execution of the war, and this must be of vital concern to the head of the nation and to the national Congress.

We can thus generalize for the national government an organization which will be suitable for the conduct of total war (see Chart). In such an organization, the President would be in control under the authority of his constitutional and war powers. He would be advised by such agencies as the National Security Council, the National Security Resources Board, the War Cabinet, and also by an advisory council for postwar planning. He would be assisted by several "assistant presidents," each of whom would have full coordinating authority within his respective responsibility. The regularly established operational agencies, such as departments and executive agencies, would continue in being, but such emergency agencies as would be required would be established either within or without the departments, according to their function. In addition, four separate organizational entities would be required. These might be termed the Military, Economic, Psychological, and Political Commands; they would conduct, respectively, military, economic, psychological, and diplomatic warfare. These commands need not be wholly new organizations. The Joint Chiefs of Staff would suffice as a nucleus for the military command, the Department of Commerce in part for the economic command, the Department of State in part for the political command. But each of the four would actually be a war headquarters for the conduct of one aspect of total war. Through these four coordinate headquarters, the national war effort would be controlled and integrated with that of the nation's allies.

### The Influence of Modern Weapons

During the last two world wars, a state of total war was approached by several of the participants. The United States was relatively less affected, by comparison, although a foundation for future comprehensive effort was laid. The terrifying new weapons of the present are only a beginning. Weapons of the future will possess not merely a simple war potential but a potential for disintegrating society and annihilating the human race.

These new weapons, and especially the more important ones now on the drawing boards and in the research laboratories, impose a new characteristic on total war. The ability of these new weapons to cover large areas with a single projectile or bomb, and their parallel ability to reach out over extremely long ranges and thus expose previously safe areas to the full hazards of war, impose on the rear areas a forward-area aspect. The characteristic thus imposed is one of difficulty in delineation of the battlefield. This leads to many new problems and complicates many of the established problems of war. Civil defense takes on a new importance and becomes a priority effort rather than a morale-boosting factor against an unlikely contingency.

The problems of defensive total war are complicated to the extreme, and they quickly encompass such weighty and costly problems as the following: extreme dispersion of industry; the design and possible construction of whole new cities, so planned as to minimize war damage; underground war plants; development in quantity of standby water courses far underground; measures for quick decontamination of large areas; development of synthetic substitutes for a large number of natural resources.

It stands to reason, accordingly, that defensive total war would be extremely costly in every sense if indulged in on an

adequate and successful scale. This brings us back full-cycle to the essence of the defense: the counterattack. As applied to total war, it dictates a national posture of sufficient strength to serve as a basis for prompt and overpowering retaliatory measures. Only in this way may the disadvantages of defensive total war be minimized and the corresponding offensive advantages utilized

### The Threat of Total War

The threat of total war, with its awe-inspiring modern weapons, has a tremendous impact on present-day world affairs. This is particularly true because the political make-up of the world today is at considerable variance with its political make-up in the past.

In the past, there were several major world powers and a consequent and potent balance of power which could be utilized as a deterrent force against aggressor nations. Also, the nationalist viewpoint predominated. Today, there are only two dominant world powers, but no potent balance of power. These two dominant powers are unique in that each represents a wholly different civilization in the world's family of civilizations; each represents a wholly diametric ideology of life. Both of these dominant powers are so deeply steeped in their respective ideologies that relations between them tend to transcend the nationalist viewpoint and take on aspects of ideological fanaticism. Their efforts in the diplomatic field follow this same tendency, which in turn has had a similar reaction in economic fields. The propaganda activities of both are completely ideologically based, and one is indulging in a considerable amount of ideological machinations against and within the other. While this tendency toward ideological fanaticism is discernible in the activities of both dominant powers and their respective allies, it is by no means positive that the nationalist viewpoint will be superseded in the relatively near future. In fact, although the present threat of total war is for total war that is ideological in nature and intercontinental in scope, the lines, if drawn, will in all probability be nationalist in character.

These basic facts have tended to delineate accurately the dominant powers and thus, in effect, delineate respectively the world's resources. In addition, one of these two dominant powers has seen fit to bring within its sphere, by the methods of cold war, those peoples of the world who exhibit no strong tendency to resist, or who possess no power to resist. In the process, it has been repeatedly demonstrated that, when the methods of cold war are not sufficiently rapid to please the aggressor, a cold war may be converted to intranational military warfare, as contrasted to international military warfare. While the latter is the conventional conversion, the former is a most ingenious conversion because, through it, an aggressor can secure his objectives and also remain wholly outside the realm of public and international law. Futhermore, he escapes the open stigma of an aggressor and places the opposing faction at a considerable disadvantage, because propriety demands that the internal affairs of one nation be not violated by another. This is a most important point, for as long as propriety is adhered to, this ingenious conversion actually is a means to outflank any close alliance resulting from defensive diplomatic warfare. Instead, then, of openly rendering assistance under the terms of such a diplomatic pact, an ally nation is forced to render its assistance, if any, in a surreptitious manner.

There have been two recent examples in international affairs which illustrate this point, even though the pacts were implied rather than written. One of these instances of surreptitious assistance resulted in total failure. The other is as yet undecided, having been rescued from fail-

ure by assistance from a wholly unexpected quarter, assistance based on the nationalist viewpoint where heretofore the ideological viewpoint virtually predominated.

We thus find an aggressor extending his sphere of influence by converting his cold war against a nation into intranational civil warfare within the nation, and then welcoming into his sphere of influence the new government resulting from that ideological civil war. Under such cold war tactics as these, the world today is rapidly, and in entirety, becoming arrayed into two opposing factions. Civil wars, instigated by cold war tactics, are in progress in marginal areas to determine the factional loyalty of those areas. The stage is thus being set for a monstrous war between Titans, a war which would inevitably be total in nature and bring victory to neither side, but disaster to both.

All of these activities of cold war, sponsored by the aggressor, are of course being countered by the second dominant power. These countermeasures, however, must be taken through the established but weakened governments of the marginal areas, and in full cognizance that all-out war between the dominant powers might impend at any stage of the process. This deterrent factor to appropriate countermeasures acts to the benefit of the aggressor power. It is axiomatic, accordingly, that the only real defense to this threat of total war is participation in the cold war to the extent required to deter it. Simultaneously, there must be a national will to accept, and to be prepared for, an all-out war should it result.

This conclusion, implying as it does the acceptance of war as inevitable, is of course untenable by our own standards of human conduct, these standards being those of the civilization and ideology we represent. By these standards, total war today is presenting mankind with its most definite and conclusive challenge. It is a challenge which, if not successfully met, may well thwart mankind's highest aspirations forever.

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**Any defense based on the assumption of surprise attack on our homeland must provide a plan for being able to withstand the initial shock, and to strike back at once to knock out the enemy's capacity to hit us again. This must be followed without delay by a tremendously accelerated mobilization of our total resources to furnish the means for a decisive military effort to knock the enemy out of the war.**

*General J. Lawton Collins*

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**A future war, if it ever comes, will be a total war. It will put the total population and resources of one set of belligerents against the total population and resources of another. Air power has made this inescapable, and air power will inevitably be the primary instrument through which a decision is reached.**

*General Carl Spaatz*

# THE BATTLE OF MILNE BAY

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*The events related in this article form a part of Mr. Milner's book, tentatively entitled* Port Moresby to the Admiralties, *which is now being prepared for the Historical Division, Department of the Army, in the series,* The U. S. Army in World War II. *Copyright 1950 by Orlando Ward; permission for reproduction may be obtained on request from the Chief, Historical Division, Special Staff United States Army, Department of the Army, The Pentagon, Washington 25, D. C.—The Editor.*

THE landing of Japanese forces at Milne Bay on the southeastern tip of New Guinea in August 1942 was part of an enemy plan to gain control of the Papuan Peninsula and of the Coral Sea.

Port Moresby, strategically the key to Australia's all-important east coast, was the main objective. The Japanese planned to take it by an overland march across the Owen Stanley Mountains. Milne Bay, which flanked Port Moresby, and covered its seaward approaches from the southeast, was to be captured to provide support from the sea for the overland operation.

Neither Port Moresby nor Milne Bay fell to the Japanese, who had to make an ignominious withdrawal from the latter place 10 days after they first landed there. Most of the credit for Milne Bay's successful defense goes to the Australians, who formed the great bulk of its garrison. However, it should not be forgotten that there were some 1,300 American troops on the scene, some of whom fought shoulder to shoulder with the Australians, and to whom a portion of the credit for the victory should go.

### The Strategic Background

In April 1942, the Japanese *Imperial General Headquarters* ordered the amphibious seizure of Port Moresby and of three key bases on the Allied line of communications between the United States and Australia—Fiji, Samoa, and New Caledonia. Port Moresby was to be taken first and operations against the island bases would follow immediately. The objective of these operations, as the Japanese saw it, was to isolate Australia in order to prevent its use as a base for counteroffensive operations against them.

The Japanese, who then had 10 aircraft carriers in commission, undertook the amphibious operation against Port Moresby in May. At the Battle of the Coral Sea, task forces of the US Pacific Fleet forced a Japanese amphibious force on its way to Port Moresby to return to Rabaul. One Japanese carrier was lost in the action, and the amphibious operation against Port Moresby was postponed.

The Japanese had meanwhile changed their plan. In addition to the operations previously ordered, two new objectives—Midway and the Aleutians—were marked for capture. Following the action at the Coral Sea, a new operational schedule was

drawn up. Under the new schedule, Midway and the Aleutians were to be taken first; Fiji, Samoa, and New Caledonia would come next; Port Moresby would be taken last.

The new plan did not prosper. In June, at the Battle of Midway, the US Pacific Fleet sank all four of the Japanese carriers engaged. As a result of this disaster, the amphibious operation against Fiji, Samoa, and New Caledonia had to be postponed, and the Japanese began an infiltration of the southern Solomons. The Japanese intention was to strike at the three Allied bases at a later date from the key island of the group—Guadalcanal.

Although they thought they could safely postpone an attack upon the Allied communications line, the Japanese felt they could not postpone the Port Moresby operation. Port Moresby lay on their flank and would have to be taken immediately. They dared not risk any more carriers in an amphibious operation against it, and therefore they decided that it would have to be taken by an overland attack from Buna across the Owen Stanley Mountains.

As the Japanese knew very little about the terrain, they landed a large reconnaissance force at Buna on 22 July with orders to report on the feasibility of the proposed mountain crossing. If the commander of the reconnaissance reported the operation to be practicable, full-scale operations would be undertaken.

Only a few companies of Australian militia stood in the way of the reconnaissance force, and its commander, Colonel Yosuke Yokoyama, lost no time in reporting favorably on the project. Lieutenant General Harukichi Hyakutake, Commanding General of the *17th Army*, who had then just arrived at Rabaul, passed on the information to Tokyo, adding that in his opinion the overland operation was feasible and should be undertaken at once. *Imperial General Headquarters* agreed, and, on 28 July, issued orders calling for the capture not only of Port Moresby but also of the Allied base at Milne Bay, of whose existence the Japanese had first learned in June, shortly after it was established.

Rabaul was advised of Tokyo's decision the same day the orders were issued and took immediate action to implement them. The Commander of the *17th Army*, the *8th Fleet*, and the *11th Air Fleet* (the Japanese Army, Navy, and Naval air commands at Rabaul) signed a joint agreement that day to commit all their available forces to the operation, in order, as they put it, "to gain control of the Coral Sea . . . in conjunction with forces operating in the Solomon Islands."

***The Japanese were attempting to seize Port Moresby when they landed at Milne Bay in New Guinea in 1942, but they withdrew in defeat 10 days later after being repulsed by Australian and American troops***

The *17th Army* then consisted of units at Rabaul, Davao, and Palau. The *South Seas Detachment*, the *144th Infantry, Reinforced*, was at Rabaul; the *41st Infantry* was at Davao; the *Aoba Detachment*, a *4th Infantry* unit, was also at Davao; and the *Kawaguchi Detachment*, the *124th Infantry, Reinforced*, was at Palau. The plan provided that the *South Seas Detachment* and the *41st Infantry*, under the *Detachment* commander, Major General Tomitaro Horii, would land at Buna in mid-August, and from positions previously prepared by Colonel Yokoyama, move on Port Moresby, via Kokoda, and the mountain pass known as the Gap. Milne Bay would be seized by the *8th Fleet* and the *Kawaguchi Detachment*. After Milne Bay was taken, a "Port Moresby Sea Attack

Force," a portion of the *Kawaguchi Detachment*, with suitable naval and air support, would make an amphibious landing at Port Moresby. The landing at Milne Bay and the overland attack on Port Moresby would be timed to take place together, thus bringing the defenders under fire simultaneously from both land and sea.

The Allies, meanwhile, were preparing to mount an invasion of their own. On 2 July, the Joint Chiefs of Staff had directed that a limited offensive be undertaken against the Japanese. The first objective was the seizure of Japanese positions in the southern Solomons. By late July, preparations for landings at Guadalcanal and nearby islands were almost complete.

Thus, as the Japanese commanders at Rabaul began preparing for the operations in New Guinea, the Allies were making last-minute preparations for the seizure of Japanese positions in the southern Solomons. Early on 7 August, the 1st Marine Division, Reinforced, went ashore on Guadalcanal, Tulagi, and adjoining islands, supported by the naval forces of the South Pacific Area, carrier task forces of the Pacific Fleet, and Task Force 44 from the Southwest Pacific Area. The weak forces the Japanese had on the islands were quickly dispersed. By evening of 8 August, the Marines were in control of Tulagi, Gavutu, and Tanambogo, and held the airfield at Lunga Point on Guadalcanal, the main objective of the operation.

The attack had been a complete surprise. The Japanese nevertheless rallied quickly. They struck back at once by sea and air and began to cast about for troops to send to Guadalcanal. To do this meant that troops already committed to the New Guinea operation would have to be diverted to Guadalcanal. After considerable debate, the Japanese decided that two battalions of the *Kawaguchi Detachment* at Palau would be sent to Guadalcanal, and the remaining battalion would go to Milne Bay. It was also decided that the *South Seas Detachment* and the *41st Infantry* would remain committed to the capture of Port Moresby. The last remaining unit of the *17th Army*, the *Aoba Detachment*, would remain in Army reserve.

In this emergency, no shipping could be found to bring the *Kawaguchi Detachment* from Palau to Rabaul. The *Ichiki Detachment*, a *28th Infantry* unit, then on its way to Palau from Guam, was therefore assigned to the *17th Army* and ordered to Guadalcanal. As soon as shipping became available at Palau, it was to be followed there by the two battalions of the *Kawaguchi Detachment*.

An advance echelon of the *Ichiki Detachment*, of less than a thousand men, landed at Guadalcanal on 19 August. It attacked without waiting for reinforcements and was promptly wiped out. As a result, it became necessary to order to Guadalcanal the battalion of the *Kawaguchi Detachment*, which was to have been sent to Milne Bay, and to assign the *Aoba Detachment* to the Milne Bay operation.

With the arrival of the *South Seas Detachment* at Buna, and the dispatch of the *Kawaguchi Detachment* and the rear echelon of the *Ichiki Force* to Guadalcanal, the *8th Fleet* began preparing for the landing at Milne Bay. *Fleet Headquarters*, which had suffered many interruptions in this attempt to get the operation underway, lost no time in undertaking it.

### Allied Position at Milne Bay

General Douglas MacArthur, Supreme Commander, Southwest Pacific Area, had ordered the establishment of a base in the Milne Bay area in May 1942, in order to provide flank protection for Port Moresby, to permit bombers to strike at Rabaul and the northern Solomons without the necessity of crossing the 13,000-foot Owen Stanley Mountains, and to provide a transshipment point for future operations on the northeast coast of New Guinea.

The difficulties of establishing the base were very great. The terrain is extremely adverse to such an undertaking, and the rainfall in the area is about 200 inches a year. The bay is about 20 miles long and from 5 to 10 miles wide with very deep water close to shore. On its northern and southern arms, the mountains of the Stirling Range rise to heights of 3,000 and 4,000 feet. Between the mountains and the sea are narrow coastal corridors, consisting mainly of dense jungle, and hip-deep sago swamp. During wet weather, these corridors are virtually impassable. At the head of the Bay is a large plain which, in prewar days, was the site of a coconut plantation operated by Lever Brothers. As the plantation area was, in the main, the only place which was not completely bogged down in mud, the majority of the base installations and the airfields had to be concentrated there.

Although construction had only begun in June, by the third week in August, Milne Bay was a good-sized base with three airfields—two under construction, and one in operation. Warned by radio intercepts and by enemy documents captured by Australian patrols that the Japanese had designs on Milne Bay, General MacArthur decided to reinforce the 7th Infantry Brigade, Citizen Military Forces, an untried militia unit, which had arrived at Milne Bay in July, with the 18th Infantry Brigade, Australian Imperial Forces, a veteran unit with combat experience in the Middle East. By 21 August, the 18th Brigade was in place. A day later, Major General Cyril A. Clowes, an experienced Australian infantry commander, took over command of Milne Bay. His instructions were to protect the airfields and to deny Milne Bay to the enemy.

By this time, Milne Force was a substantial command. In addition to the two infantry brigade groups, it included 25-pounder field pieces, light and heavy Australian antiaircraft units, and the 709th US Airborne Antiaircraft Battery, which was armed with 50-caliber machine guns. Air strength included two Royal Australian Air Force fighter squadrons, equipped with P-40s, and part of a RAAF Hudson reconnaissance squadron.

A battalion of American engineers (two companies of the 43d Engineers and a company of the 46th), were working on the airfields—the 43d Engineers on No. 3 Strip, just off the north shore, and the 46th Engineers on No. 2 Strip, which was near the south shore. The engineers, in addition to their M1s and light machine guns, were armed with 50-caliber machine guns, and 37-mm antitank guns on half tracks. The total Australian troop strength was 7,429 men, of whom 6,394 were combat troops, and 1,035 service troops. American troop strength, consisting mainly of engineers and antiaircraft personnel, was 1,365 men. The strength of the RAAF was 664 men, most of them at No. 1 Strip in the center of the plantation area.

Although a great deal of work, under the most adverse conditions, had gone into the construction of the base, much still remained to be done. The roads were in very poor shape. The dock at Gili Gili consisted of two barges placed side by side, with a ramp leading to a small and ridiculously inadequate jetty. Number 1 Strip, the only runway then in operation at Milne Bay, consisted of a steel mat laid over a low-lying and poorly-packed base. Mud seeped through the mat, and caused aircraft using the field to skid and sometimes crack up. As there was no time to rebuild the field, all that could be done to remedy this condition was to have the mud scraped off periodically by bulldozers, which deposited it in piles on either side of the strip. Despite these and other difficulties, General Clowes, with some 9,500 men under arms, was equipped to discharge his mission. How

well he and his men did so was soon to be put to the test.

### The Landing

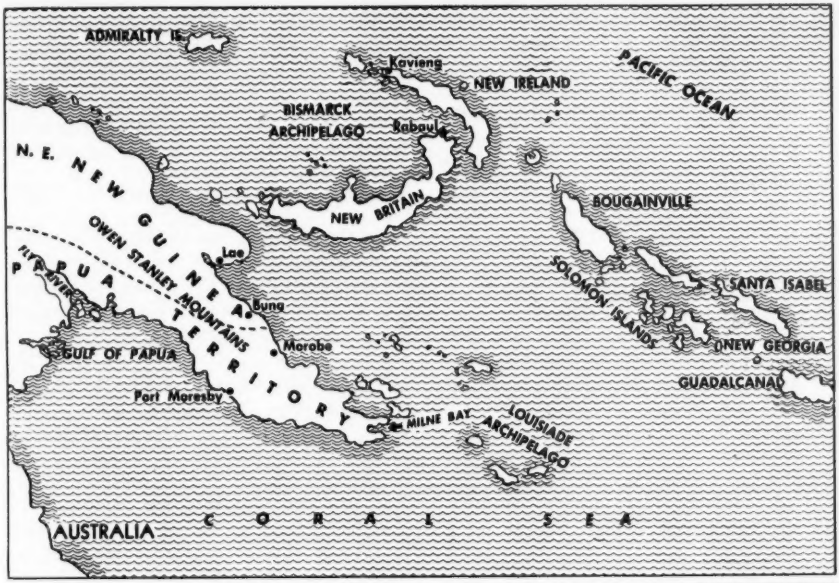
Although the *Aoba Detachment* was still at Davao and could not immediately be brought to Rabaul, the *8th Fleet*, which had some naval troops at Kavieng, decided to proceed with the Milne Bay operation without waiting for the *Aoba* troops to come in. *Fleet Headquarters* erroneously estimated that Milne Bay was held by 2 or 3 infantry companies, and 20 or 30 aircraft, and on 20 August, ordered some 1,500 men to Milne Bay. Of these, 1,171 men (612 troops of the *Kure 5th Special Naval Landing Force* (SNLF), 362 men of the *10th Naval Pioneer Unit*, and 197 of the *Sasebo 5th* (SNLF)), were to come from Kavieng; and the rest, 353 *Sasebo 5th* troops, were to come from Buna. Commander Seijiro Hayashi, Commanding Officer of the *Kure 5th*, was under orders to land at Rabi, a point about 3 miles from the Gili Gili wharf area. The troops from Buna were to land at Taupota on the northeast coast and march on Gili Gili overland.

The first echelon from Kavieng, bearing mostly *Kure 5th* troops, left Rabaul for Rabi in the early morning of 24 August. The *Sasebo 5th* troops at Buna left for Taupota in seven large motor-driven landing barges at approximately the same time. The seven landing craft were first detected by the Allies off Tufi on the same afternoon, and, early the next morning, reconnaissance aircraft reported that they were nearing Goodenough Island. Twelve P-40s from Milne Bay (which had been unable to attack previously because of enemy raids and bad weather) took off for Goodenough Island at noon, and shortly thereafter they discovered the landing craft beached on the southeastern tip of the island, where the Japanese had put in to stretch their legs and to prepare a meal. The P-40s gave the drawn-up barges a thorough strafing. When the attack was over, all the landing craft had been destroyed, and the *Sasebo* unit, its stores, ammunition, and communications gone, was left stranded on Goodenough Island, where it was subsequently mopped up by the Australians.

The convoy bearing the *Kure 5th* troops fared better in the approach to its target. The transports, heavily escorted by cruisers and destroyers, were first sighted off Kiriwina Island, northeast of Goodenough, in the early morning of 25 August. It was clear that they were making directly for Milne Bay. Allied Headquarters immediately ordered the Air Force to attack the convoy and destroy it. All available B-25s and B-26s at Townsville, and nine B-17s at Mareeba, in the Cape York Peninsula, took off at once for the attack.

Fortunately for the Japanese, the weather—except for a short break at noon which the RAAF had exploited to the full in the attack on Goodenough Island—was very bad all day, both at Port Moresby and Milne Bay. It was so bad, in fact, that for many hours planes were unable to take off from either place. Attempts by the B-17s from the Cape York Peninsula and the P-40s and Hudsons at Milne Bay to hit the convoy proved fruitless because of violent rain squalls and a heavy overcast. Visibility by late afternoon was down to zero, and, despite occasional breaks thereafter, the Air Force found it impossible to attack successfully that day.

After shelling the beaches from the sea, the Japanese began landing shortly after midnight at three points on the north shore of the Bay—Lekwind, Waga Waga, and Wandala, 8, 10, and 12 miles from Rabi, the prescribed landing point. The landing force, which had mistaken Lekwind for Rabi because of the heavy overcast, set up headquarters at Waga Waga and established supply dumps there and in the Wandala area. Lekwind became the


ADMIRALTY IS.
Kavieng
NEW IRELAND
PACIFIC OCEAN
BISMARCK ARCHIPELAGO
Rabaul
N. E. NEW GUINEA
NEW BRITAIN
BOUGAINVILLE
OWEN STANLEY MOUNTAINS
Lae
PAPUA
SANTA ISABEL
SOLOMON ISLANDS
Buna
NEW GEORGIA
Morobe
GULF OF PAPUA
TERRITORY
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Port Moresby
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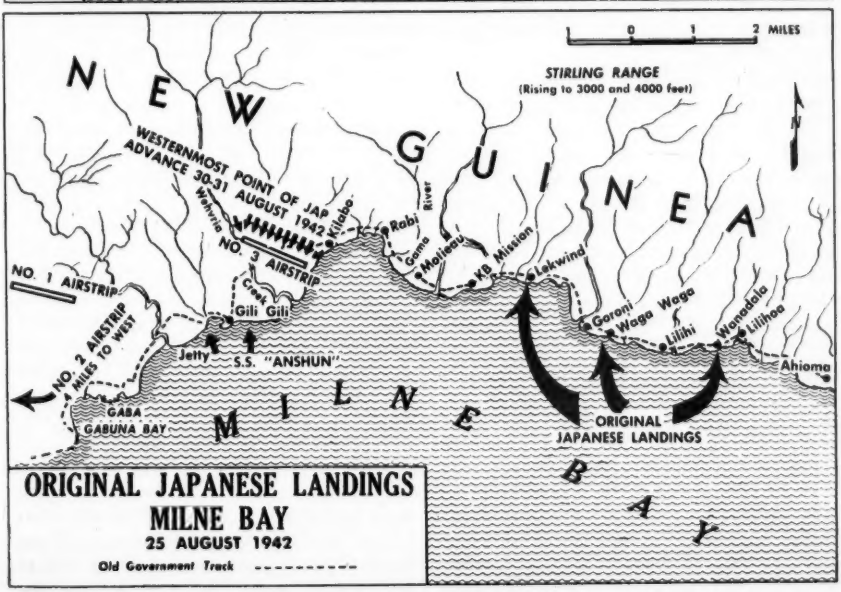

0 1 2 MILES
STIRLING RANGE
(Rising to 3000 and 4000 feet)
NEW GUINEA
WESTERNMOST POINT OF JAP ADVANCE 30-31 AUGUST 1942
Wakvia
Kilaba
Rabi
River
Gama
Mailelau
KB Mission
Lakwind
NO. 3 AIRSTRIP
NO. 1 AIRSTRIP
Creek
Gili Gili
Goroni
Waga Waga
Lilihi
Wanadala
Lilihoa
Ahioma
Jetty
S.S. "ANSHUN"
NO. 2 AIRSTRIP
4 MILES TO WEST
GABA
GABUNA BAY
MILNE BAY
ORIGINAL JAPANESE LANDINGS
ORIGINAL JAPANESE LANDINGS
MILNE BAY
25 AUGUST 1942
Old Government Track

main Japanese bivouac area and forward departure point.

The Japanese could scarcely have chosen a poorer landing place. Their objectives, the airfields and the wharf, were at the head of the bay. They had landed miles away on a sodden, jungle-covered coastal shelf. It was virtually impossible to maneuver there, not only because of the almost impenetrable jungle and swamp covering it, but also because of the mountains to the north, which are often as little as a half mile from shore.

It had rained steadily during the preceding few weeks, and the heavy tropical downpour continued. The mountain streams had become torrents, and the spongy soil of the corridor a morass. The single coastal track which skirted the corridor had become a quagmire, and the level of the many fords which crossed it had risen to almost 3 feet. Except for a few abandoned plantations and mission stations, the corridor was a sodden welter of jungle and swamp, a nightmare for any force operating in it.

Although they were hopelessly outnumbered and had landed miles from the head of the bay on a muddy coastal shelf, the Japanese did enjoy some tactical advantages. Their left flank was secure, since they had control of the sea in the operations area, and their right flank could not easily be turned because of the mountains to the north. They could count on little air support, as Lae, their nearest air base, was 340 miles to the north, but they did have landing craft. This enabled them to move men and equipment forward at night, despite their deficiency in the air. They enjoyed another and even greater advantage. With Task Force 44 and other Allied naval forces concentrated in the South Pacific, the Japanese were in a position to bring in reinforcements almost at will, under cover of bad weather. The knowledge on the part of the Allies that the Japanese had the power to land reinforcements in this way also worked in their favor. It forced General Clowes, who neither knew nor had any way of knowing the strength the Japanese intended to commit to the operation, to hold back his main force till he was satisfied that they intended to land only on the north shore.

### The Attack

At the moment that the Japanese began landing, Milne Force, the main body of which was deployed at the head of the bay, had two companies of the 61st Battalion, 7th Brigade, in the path of the invasion—one at Ahioma, just east of Wandala, the other at KB Mission, a plantation and mission station about a mile west of Lekwind. In addition, there was a platoon of the 61st Battalion at Taupota on the northeast coast.

At 0140, 26 August, a few minutes after the first landings began, a Japanese spearhead clashed with the company at KB Mission. Bogged down in mud, and confused as to their whereabouts, the Japanese attacked unsuccessfully through the night. At dawn, they withdrew to Lekwind.

The company at Ahioma did not fare so well. It was under orders to return to Gili Gili by sea and two of its three platoons had been on their way there when the landings began. The troops, in two ketches, had no sooner left Ahioma than they ran into a Japanese landing wave off Wandala. One of the ketches was sunk, but the troops in the other boat escaped, and with the remaining platoon, marched to Taupota, and thence to Gili Gili, where they rejoined their battalion several days later.

By 0745 that morning, the weather had abated sufficiently for the P-40s from No. 1 Strip, and the B-17s staging from Port Moresby, where they spent the night, to go into action. In an extremely successfull morning's business, the P-40s managed to destroy most of the food and

ammunition the Japanese had brought with them, and the B-17s inflicted heavy damage on a Japanese transport while it was unloading offshore.

Towards evening, a second Japanese convoy was sighted off Normanby Island, making at high speed for Milne Bay. Before the convoy could be dealt with, a heavy fog descended over the area, blotting out its further movements. The troops aboard landed safely that night. The 1,170 man movement from Kavieng had been completed.

The Japanese, who had reconnoitered the Mission during the day, struck again that night in much greater strength than before. Although by this time a second company of the 61st Battalion had reached the Mission, the Australians were forced back to the Gama River, just forward of Rabi. The Japanese broke off the engagement at dawn and withdrew as before to the Lekwind area. The Mission was left unoccupied.

Thinking that the enemy might be withdrawing, General Glowes, ordered forward the 2/10 Battalion of the 18th Brigade the following morning.* Its orders were to keep in contact with the enemy. Clowes held back the rest of his troops because, as he was to report later, he had "to consider the possibility of a fresh attack from the sea either frontally or on my left flank." The 2/10 Battalion reached the Mission unopposed in the late afternoon of the 27th and set up a light defense perimeter for the night. Its intention was to move on again in the morning.

At 2130, the Japanese again struck at the Mission, with two tanks and all their available combat troops. Despite the unceasing rain, the ground in the well-drained and relatively open Mission area was firm enough for tank action. The two tanks, equipped with brilliant headlights, cruised about almost at will and caused the 2/10 Battalion heavy casualties. The Australians, only lightly armed and without antitank support, were unable to knock out the tanks and also failed to shoot out their headlights. After about 2 hours of fighting, the Japanese managed to split the battalion in two. Battalion headquarters and two companies were forced off the track and into the jungle, and the remainder of the Battalion was pushed back to the Gama River and also cut off. A portion of the Battalion reached the plantation area that night, but the main body, which took to the hills in order to get around the enemy's flank, only succeeded in doing so 3 days later.

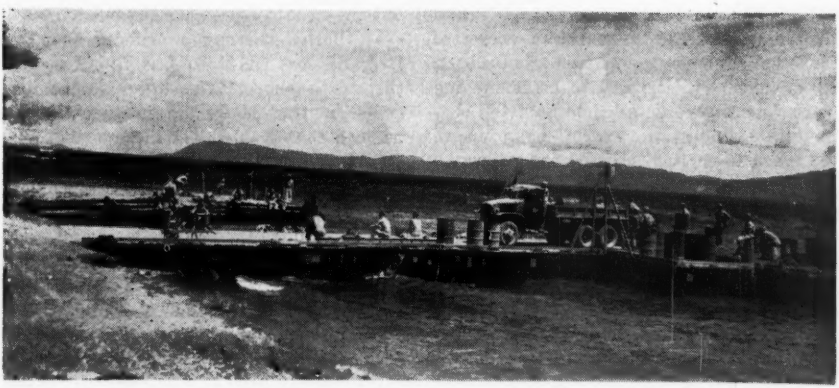
The Japanese, after pushing the 2/10 Battalion out of the way, continued on to No. 3 Strip. The real fight for Milne Bay developed at that strip, a fight in which American antiaircraft and engineer troops were to play a most significant part.

The east-west airstrip, only a few miles west of Rabi, was an ideal defensive position. The runway, a hundred yards wide and 2,000 yards long, was cleared but only partially graded, and the Rabi track at its western end was a sea of mud through which no tank could pass. The strip afforded the defenders a broad, cleared field of fire. Lying obliquely across the mouth of the corridor, with its northern end close to the foothills of the Range, and its southern end less than 500 feet from the water, it was directly in the path of the Japanese advance.

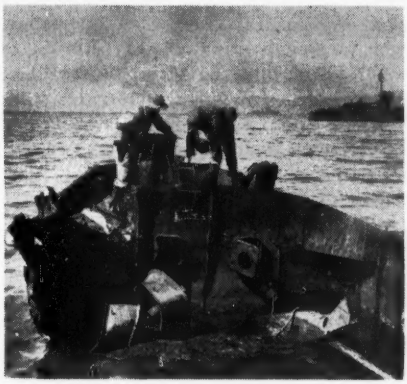
Brigadier J. Field, of the 7th Brigade, who was in charge of the defense, ranged his troops along the eastern edge of the strip. The main burden of holding the strip fell upon the Brigade's 25th and 61st Battalions, but the 709th Airborne Antiaircraft Battery, and Companies D and F of the 43d US Engineers were assigned key positions in its defense. The antiaircraft battery with its heavy 50-caliber machine guns was given the task of

* The author wishes to express his indebtedness to Lt. Col. Peter S. Teesdale-Smith, AMF, a company commander of the 2/10 Battalion, 18th Brigade, for the details of his battalion's fight with the enemy on 27 and 28 August 1942.

These are Australian photos taken in the Milne Bay area in 1942, after the Australians and Americans had repulsed a Japanese landing. Above, typical Milne Bay terrain, where the ground fighting took place on the narrow coastal strip. Below, Japanese tanks knocked out in the battle.—Australian News and Information Bureau photos.



Additional Milne Bay photos taken in 1943 show some of the places where the battle with the Japanese took place in 1942. The Japanese were attempting to seize Port Moresby, New Guinea, when they made their attacks. Above, two jetties at the KB Mission. Right, a wrecked Japanese landing barge near the beach road; the barge was destroyed between KB Mission and Ahioma. Below, a general view of installations at Kaloi Bay, where barges were being unloaded at several jetties. With Milne Bay made safe in 1942, the area became an important base for further operations against the Japanese.—US Army photos.



holding the northern end of the strip, and the 50-caliber and 37-mm gun crews of the two engineer companies, flanked on either side by Australian riflemen and mortarmen, were detailed to hold the center of the line at the crucial point where the track from Rabi crossed the runway.

The Japanese reached the area in front of the strip just before dawn. They attacked repeatedly, supported by machine guns, mortars, and light field pieces, but were repulsed each time and eventually were forced to withdraw. No tanks were used in the attack although two of them (the same two that the Japanese had used with such success at KB Mission) were brought up, only to bog down within sight of the defenders. There the 25-pounders, which were operating about a half-mile to the rear, quickly knocked them out.

The enemy was now within a few miles of No. 1 Strip, and General Clowes, fearful lest they infiltrate it during the night, ordered the P-40s to Port Moresby. The Japanese, fortunately, were quiet that night, and, the following morning, the fighters returned to Milne Bay to stay.

General Clowes had meanwhile received orders, emanating directly from General MacArthur, to clear the north shore of Milne Bay immediately. General MacArthur issued the orders to General Sir Thomas Blamey, Commander Allied Land Forces, on the 26th, the day of the landing. The Commander in Chief gave it as his "professional opinion" at the time that the landing on the north shore would be reinforced within 72 hours. Because of defective communications, Milne Force did not receive the orders until late on the 27th. The following morning, General Clowes ordered the 7th Brigade to be prepared to move forward to KB Mission at dawn the next day. The orders were cancelled later in the day on the ground that another attack on No. 3 Strip appeared to be imminent. Strong patrols of the 7th Brigade were sent out early on the 29th, but they could not locate the enemy. General Clowes thereupon ordered the 18th Brigade, less the 2/10 Battalion, to clear the north shore. The orders were cancelled a few hours later when it was learned that a third Japanese convoy was on its way to Milne Bay. General Clowes gave as his reason for the cancellation that he was "still apprehensive of an enemy attempt to land on the west and south shores of Milne Bay."

The convoy, escorted by a cruiser and nine destroyers, unloaded that night under cover of a heavy mist. It brought to the Japanese on the north shore 775 reinforcements—575 troops of the *Kure 3d* SNLF, and 200 of the *Yokosuka 5th* SNLF, under navy Captain Minoru Yano, who took over command of operations.

The daylight hours of the 30th were quiet. Milne Force sent out patrols to feel out the enemy in preparation for the long delayed advance, and the Japanese, hidden in the jungle, consolidated for another attack on No. 3 Strip. The climax came that night when the Japanese made an all-out attempt to take the strip. As before, the 25th and 61st Battalions bore the brunt of the attack. The machine-gun and antitank-gun crews of Companies D and F of the 43d Engineers, who were again assigned a key position in the center of the strip, and the 50-caliber machine guns of the 709th Antiaircraft Battery (which, this time, were deployed at either end of it) again played a notable part in the defense.

The Japanese made a supreme attempt to cross the strip, but so intense was the fire which met them that not a single enemy soldier was able to do so. The heaviest attack came just before dawn. It was also repulsed with heavy loss to the enemy, who withdrew at first light, leaving 160 dead behind, a large part of them in front of the position held by the 43d Engineers. The enemy dead were buried where they lay.

### The Withdrawal

The Japanese had done their utmost and failed. The 18th Brigade, under Brigadier G. F. Wootten, with the 2/12 Battalion leading, began the task of clearing them from the north shore the following morning. Heavy fighting developed at once along the Gama River and later near KB Mission, but it was not to be long sustained. At the Gama River, the enemy lost almost 100 killed, and his casualties mounted steadily as the Australians advanced. Hungry, riddled with tropical fevers, and with many wounded in their midst, the Japanese realized the end was near. Captain Yano, himself wounded, so advised the *8th Fleet* at Rabaul.

The Commander in Chief of the *Fleet*, Vice Admiral Gunichi Mikawa, considered the possibility of reinforcing the landing with the *Aoba Detachment*, a force of about 1,000 men, whose advance elements had finally begun landing at Rabaul on 31 August. Admiral Mikawa offered Captain Yano 200 more *Yokosuka 5th* troops immediately and the *Aoba Detachment* by 12 September, if there was any possibility that the troops at Milne Bay could hold out until the *Aoba* force arrived. However, when he was told that the troops ashore were physically incapable of making a further stand, Mikawa concluded the situation was hopeless and ordered Milne Bay evacuated.

The wounded were put on board ship on the night of 4 September. The rest of the landing force, except for scattered elements who had to be left behind, took ship the following night from the anchorage at Waga Waga. The evacuees were only one jump ahead of the 18th Brigade, whose forward elements were actually within earshot when the Japanese pulled out. About 1,300 of the 1,900 or so troops landed were evacuated, virtually none of them in condition to fight.

The 2/9 Battalion, which was now leading the advance, met only light and scattered resistance on the 6th. By the morning of the 7th, it was clear that all organized resistance had ceased. All that remained of the Japanese landing forces were small bands of stragglers. These were disposed of in the next few weeks by Australian patrols, who were able to take only a handful of prisoners.

Scarcely had the Japanese evacuated the north shore than Task Force 44, which had been operating in the Solomons, was returned to the Southwest Pacific. This made it possible thenceforward to cover the sea approaches to Milne Bay. The dispatch to Milne Bay, during September, of two 155-mm G.P.F. guns, with attached searchlight units, helped further to secure the area.

The base, meanwhile, was being steadily improved. More and better roads were built; a new wharf was constructed to reinforce the old inadequate jetty; No. 1 Strip was rebuilt, and the construction of the other two airfields, held up because of the Japanese landing, was resumed and completed. The stage was set for the cismontane bombing of Rabaul and Japanese bases in the northern Solomons, and for the successful infiltration of the north coast of Papua from East Cape to Buna.

The victory at Milne Bay, which General MacArthur attributed to "the complete surprise obtained by our preliminary concentration of superior forces," had snapped the southern prong of the pincers which the Japanese had hoped to apply to Port Moresby. An essential part of the Japanese plan had failed. The rest of the plan, the overland attack on Port Moresby by the *South Seas Detachment*, was also destined to fail. General Horii's force, its spearhead high in the Owen Stanleys when Milne Bay was evacuated, was to glimpse Port Moresby from afar, but never to reach it.

# The Military Student

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THERE are more military students in the United States now than ever before in the history of the country. The impetus of the past War, the atom bomb, liberal grants of all or part tuition, and educational programs of the military establishment itself, have resulted in a veritable renaissance of study by military personnel. Military personnel, professional, and reserve, in service schools, civilian colleges, and universities all over the country are studying to their own great benefit and the benefit of our nation. Foreign officers in considerable numbers are attending our military schools, and United States officers are attending foreign schools. But with all of this study going on, little attention has been paid to the techniques which would make of these military people really effective students.

### Study Effectiveness

It is important that military students study with maximum effectiveness. Anything which will increase military student competence is desirable and a saving of defense dollars. The student himself, in competition with his military associates or under even greater stress to do well outside the military circle, is certainly desirous of doing his best. Moreover, military leaders, constantly required to study and analyze materials, situations, and problems of their changing profession, need to study effectively. Their perennial role as teachers also requires that they know how to study. In fact, it is difficult to conceive of any person, regardless of his business or profession, who would not be benefited by knowing how to study.

At the Command and General Staff College, study methods are being taught. Surveys and experience with student classes at the College indicate that, in spite of the exceptionally high motivation among the officer students, a large number of them do not apply many of the purely mechanical techniques of the successful student. You may wonder at the inclusion of this elementary field in the College curriculum. By the time a person reaches college level, it might be assumed he knows how to study. But many military students have been long away from studying. Many have forgotten, never knew, or fail to apply study devices which research finds are common to all good students.

This failure to apply study techniques is not confined to military students alone. No less than nine large American universities are studying the problem and have developed clinics and remedial courses on the subject. But unnumbered thousands of students will never have the benefit of these courses. And only a small percentage of military students will ever attend the course at the Command and General Staff College. Nevertheless, any student can learn these simple methods and all persons who study would benefit by learning to apply the few sound study techniques recommended here.

### Application of Techniques

Most of these techniques are so well known that they have the familiar ring of platitudes. However, it is the application of these methods, or their application in an orderly fashion, which will improve the standing of the student. All study methods stress an orderly sequence for applying the techniques. Dr. F. P. Robinson of Ohio State University advocates a study routine where the student surveys the material, formulates questions which he puts to himself while he reads, recites, and reviews. An orderly study sequence falls very naturally into a military pattern. This military pattern involves an estimate, planning, attack, and review.

Any student unconsciously makes an estimate of his study problem. He knows that he has a certain course to pass or grade to attain. He knows that his path will be strewn with obstacles such as examinations or term papers. However, a military student probably goes through this estimate consciously and more thoroughly. His training leads him to a systematic analysis. His analysis points toward his objective, sizes up the ways to reach it, and decides upon the best way to attain the goal. Family or personal problems, anything which might develop into a distraction from the study achievement, must be taken into account. The estimate goes carefully into the details of proper desk placement, proper lighting, accessibility of materials, and the best hours for study, eating, sleeping, and recreation. Most important of all, this estimate includes the student's analysis of himself.

An early self-analysis is a valuable student aid. An honest, realistic appraisal of his own personal, mental, and physical equipment, his experience and abilities, permits a student to capitalize on strong points while strengthening or avoiding anticipated weaknesses. A student who likes to talk, but who takes his study to the library where talking is prohibited, is making good use of an analysis of his weakness.

Having determined the study obstacles, the student plans to overcome them. His plan or program to complete his course or to write his thesis follows the best method of reaching the objective as determined by the estimate. Careful planning and scheduling can produce a balanced, progressive effort which makes best use of resources and insures results. Dividing the project into weekly or monthly subobjectives is one effective method of programing.

***Study techniques are simple. They involve a methodical approach to include estimating the problem in the light of the objective, planning the elimination of obstacles, attacking aggressively, and reviewing***

### Scheduling

Most study methods stress the use of a personal schedule by the student. This personal schedule is designed to provide a full, balanced, practical day of work, study, and diversion. The schedule does not have to be rigid or detailed to be effective. Conscientiously followed, it becomes easier through habit. This good habit formation is a cardinal point with some educators who advocate beginning study periods precisely on time. Repetition then ingrains the good habit until it becomes easy.

A schedule can make use of many hours normally not considered as available. Contrary to standard American practice, prof-

itable hours can be found for study in the early mornings.* Other potential study hours can be salvaged from most week ends. A schedule can also space review periods judiciously to avoid the last minute scramble of "cramming" for examinations.

The difficulty, however, lies in putting the planning and the schedule into practice. American tactical doctrine stresses the offensive, and this principle is no less applicable to study. Consequently, the word "attack" is selected to describe the study processes used in putting the plan to work. Approaching the study task with an aggressive mental attitude gives the student all of the advantages of the attacker. Since learning is best accomplished when the student is ready to learn, this mental attitude facilitates learning. Psychologists tell us that with an optimistic, enthusiastic approach, a certain amount of relish can be developed for a study task. This induced enthusiasm develops into real interest as more is learned about the subject. As more is learned, possibilities of association with other facts are increased. This progressive addition constitutes another learning process, since we build upon what we know.

### Learn by Doing

Another learning method is to learn by doing. The active processes of the study attack are the highest order of doing. First, the material is scanned for purpose and scope, making full use of tables of contents and subject headings. In this manner, the object of the assignment is determined, so that the perusal which follows turns up the important points read. This selection of the important matters covered is called selective study. It is worth noting that poor students are notorious for reading and rereading study material with little regard for purpose or salient features of the matter under study. Selectivity, however, is vital to sound study.

Selected important items are noted in various ways. Many good students make these key points into an outline. Others underline the important points. Still others make notes of selected portions in text margin or notebook. For best results, the note-making or outlining is done in the student's own words. This method uses two means to fix the chosen items in the mind of the learner, selection and rephrasing.

Another study-attack technique is rapid reading. Some educators are enthusiastic about results obtained by reading fast. It has been demonstrated that reading rates of individuals can be greatly accelerated with slight loss in ability to absorb the ideas read. The beneficial technique here is the absorption of ideas, rather than single words. This process assists in selective study.

Additional techniques which are helpful in assisting the study attack are filing and organization of materials. Proper filing saves student time and assists in ready accessibility of materials for reference. Organization of equipment and reference data and familiarity with texts and equipment further promote efficiency and save time for the student.

### Review

The clincher in the learning routine, however, is review. Study clinics, in analyzing the nature of memory, have shown that retention is most improved by immediate review. Retention is further improved by reviewing regularly. All review must, of course, be selective. Also, as in the initial study, the procedure must be active. Self-recitation is beneficial in re-

* Dr. Douglas Southall Freeman, in a talk on "Leadership," said: "The trouble with people of the United States as respects professional careers is that they get up too late and they stay up too late. America needs nothing more than to get up earlier in the morning."

viewing, as are outlining and note-making. The habit of periodic review, at the end of the day's work, at week's end, and before an examination, consolidates and selects for retention only the important elements. This selective refresher insures progressive learning and permits the student to approach examinations with equanimity and a minimum of last-minute preparation.

Examinations are the bugaboo of all students. They can be, however, conquered by using the same aggressive, methodical approach, i.e., estimate, plan, and attack. Thoroughly prepared by planned systematic review, the student avoids the mental disorder of "cramming" and approaches the trial rested and assured. Once arrived at the examination, the student surveys the entire test to determine its scope. He roughly budgets his time. He then attacks, answering the questions he knows first. In solving each problem, he reads the requirement first to fix in his mind exactly what is wanted. He watches his time to be sure to get down on paper the thoughts which will be worth maximum credit. Before turning in his paper, he checks to see that he has answered precisely what was required.

These simple, elementary rules are almost too obvious to recommend to mature students. Yet these same simple fundamentals, many of them known and applicable since childhood, are being violated daily. Systematic application is not easy, but it is a sure guarantee of the reward of higher standing.

A thesis or term paper can be approached in much the same manner. The research job lends itself readily to scheduling, once the initial estimate is made of the job to be done. Periodic reviews of progress assure the steady accomplishment of the objective according to the planned attack. Time budgeting, proper use of card files for references, and organization of materials are important in this instance.* Fortunately, excellent libraries, fine indexes, and cooperative professional librarians and researchers are available in almost every locality. These splendid facilities are extremely helpful to the student. The sympathetic interest of highly qualified and well-educated custodians and archivists is a valuable asset to the student researcher. The Historical Division of the Department of the Army is most interested in and helpful to the military student. Those who are in Washington will also find the personnel of the National Archives and the Library of Congress cooperative and eager to be of assistance.

### Summary

Only a fraction of the students taking courses today have had any instruction in the technique of study. These techniques are simple, are applicable to any person with a study problem, and pay great dividends in increased student effectiveness. They can be of assistance to the graduate student at a civilian institution, to the enlisted man at officer's candidate school, to the individual taking extension courses, to the cadets at service academies, or to a civilian solving a knotty business problem.

In essence, study techniques are simple. They involve a methodical approach which includes estimating the problem in the light of the objective, planning the elimination of obstacles, attacking aggressively, and, finally, the review or analysis to assay progress. A most important beginning for a student is self-analysis. Scheduling, which finds lost hours, is also vital, as is the phased approach with sub-

* In this connection, Dr. Freeman says: "Sometimes the difference in a man's career may be the difference between the time he loses and the time he saves in turning from one job to another. If you are working on a continuous task, keep it on your desk open all the time so that, if you have but 15 minutes, you can jump right into it."

objectives. Of course, the attack is the pay-off. Active, selective learning, by outlining, self-recitation, and review, pay the real dividends. These good methods, repeated often enough, develop into real study habits.

These are techniques which analysis has shown are used habitually by good students. They sound very simple. In fact, they sound so simple that the problem is, perhaps, one of convincing the student he is not applying them habitually. He should do so. It is notable that poor students use very few, if any, of these methods. We must get these simple study mechanics to the attention of our students. Once tried, the methods will sell themselves. In order to have more good students, we must make available to all of them the fundamentals of effective study techniques.

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**Knowledge, like wisdom, is self-acquired. The finest instruction is wasted on an unreceptive or resistant mind. On the other hand, the inquiring mind can always find enlightenment, often without assistance and even despite great handicaps.**

*General Omar N. Bradley*

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**You cannot teach a man anything; you can only help him to find it within himself.**

*Galileo*

# Movement Control in a Theater of Operations

Major Charles E. Rochford, *Transportation Corps*
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## Importance of Transportation

THE fundamental importance of movement in war is sometimes overlooked.

Because of the rapid development of faster means of transport, with greater capacity, military men are prone to grow complacent about our ability to move. Certainly, we now have faster, more effective motor vehicles; pipe lines for transporting liquid fuels; larger, faster transport aircraft; and improved water transport. These have all contributed to the ability of the transportation service to move armies, their equipment, and supplies.

What is often forgotten is that the corresponding development in the tools of war are adding to the burden of the transportation service, both in terms of requirements for transportation and in the complexity of those requirements. Every time a new or additional weapon is placed in the hands of the fighting man, the difficulty of moving and supplying him is increased. As an example, nearly six times as much matériel per man had to be supplied and transported in World War II as was required in World War I.

The enormity of the problem of moving men and materials has forced all modern armies to face the fact that transportation influences, and sometimes dictates, strategy as well as tactics. The success of combat operations is directly dependent upon the ability of the transportation system to support the operation.

In planning future operations, the limiting factor is often the lack of transportation. The transportation system must therefore be organized to make maximum use of the available means of transport. Its operation must be coordinated and controlled by the commander and his staff to provide full support and yet retain the flexibility necessary to meet the changing tactical situation.

The means of transportation which make up the transportation system in a theater of operations may include water, highway, railway, pipe line, and air. The establishment or operation of these means of transport creates lines of communications upon which armies in the field depend for their support.

## Transportation Is a Service

Transportation cannot be stored or saved for future use. It is a service in the fundamental sense of the word.

Movement does not add to the quantity or change the characteristics of supplies in any way. All that is accomplished by movement is a change of location of the matériel or the personnel transported.

***Movement control fits the capabilities of communications lines to the demands of the users of transportation, according to priorities set by the commander, and thus gives full support to military operations***

Furthermore, it may be said that transportation is perishable, since, if the daily capacity of a means of transport is not used, it cannot be recovered. Thus, if a truck company has the capability of transporting 200 tons forward a distance of 75 miles, and returning in a single day, the company must haul every day or there is a loss of 200 tons of movement capacity each day the company is idle. Physical limitations on the truck company simply do not permit 2 days' hauling in 1 day.

Since there rarely, if ever, is an over abundance of transportation in a theater of operations, there has evolved a staff approach to the problem of obtaining the efficient utilization of the available transportation capacity. Efficient operation of the means of transportation will, of course, increase the useable capacity of the transportation service. But an increase in capacity is of no value unless it is fully utilized.

### Principles of Movement Control

The staff approach to the problem of obtaining full utilization of transportation capacity is through the function of movement control. The purpose of movement control is to fit the capabilities of the lines of communications to the demands of the users in accordance with the priorities established by the commander, and thus to provide full support of the military operations. Movement control may be defined as the planning, coordination, and control (in a staff capacity) of all movements over lines of communication.

This planning, coordination, and control of movements has as its aim the achievement of four conditions which are necessary to the full utilization of the means of transport making up the lines of communications. These four conditions are:

1. Designation of the means of transport to be used so as to utilize each means of transport most efficiently.
2. Full use of the carrying capacity of each means of transport.
3. Achievement of an even flow of matériel and personnel over the lines of communications.
4. The integration of all means of transport through the various commands, from point of origin to destination.

A brief examination of these four conditions will indicate their importance.

### Designation of the Means

The importance of "designating the means of transport" lies in the fact that the various means of transport vary in their relative military economy and speed of movement. From the military point of view, the means of transport are usually arranged in the following order of economy: (1) pipe line, (2) water, (3) rail, (4) highway, and (5) air.

One of the basic principles of movement planning is that the available capacity of the most economical available means of transport is employed first, and as far toward the destination as possible. However, the most economical available means of transport may also be the slowest. Since both the requirements of the users and the priorities established by the commander must be satisfied, the ability and authority to "designate the means of transport" is obviously necessary if the movement control staff is to provide full support of the military operation.

### Full Use of Capacity

The full use of the carrying capacity of each means of transport is a self-evident requirement in achieving the full utilization of transportation capacity. Full use of carrying capacity rests on several factors which conserve transportation, and these factors are largely the obligation of the user.

Among these factors are: (1) the loading by the user to authorized limits of every truck, railway car, barge, airplane, or other carrier; (2) prompt loading and unloading by the user; (3) careful plan-

ning of the distribution system by the user to avoid backhauling and rehandling enroute to destination; (4) planning and coordination to provide return loads; (5) and routing of shipments by the transportation operator over the shortest feasible route.

Seldom do the users of transportation appreciate the importance of these factors. The retention of a few railway cars or a few trucks for an extra day seems insignificant; and it would be, if it happened at only one location. But when this is happening in dozens of places at the same time, it means the complete waste of thousands of railway cars and thousands of trucks for which there is usually an urgent need. The organization which is wasting transportation by failing to unload trucks and railway cars is often the one which complains bitterly that it cannot obtain sufficient transportation.

### Even Flow

The importance of an even flow of shipments over the lines of communications must not be overlooked because, as pointed out earlier, transportation may be considered perishable. Unless an even flow of supplies and personnel is achieved, it will not be possible to utilize the daily capability of the lines of communications. Supplies normally arrive in a theater by the shipload, with the ships in convoys. This means vast quantities arriving at intervals. The movement staff must plan for the arrival of these convoys and coordinate the movement of the supplies through the ports to their destination. If congestion develops at any point from port to unloading at destination, delays, rehandling, waste of manpower, and waste of transportation will result.

### Integration

The integration of all means of transport is necessary since the transportation service of a theater of operations is largely concerned with through traffic. This through traffic cannot take into account the artificial military boundaries which have been established largely for administrative purposes.

Likewise, it is readily apparent that the operation of ports, railways, trucks, barges, and other means of transport must be integrated under one head if an even flow of shipments utilizing the entire transportation capacity is to be achieved.

Even those means of transport not operated by the transportation service must be integrated into the transportation system. Pipe line transportation operated by the engineer service must be integrated and coordinated with other means of transport. Pipe lines cannot be built to every depot and consumption area. Water, rail, highway, or air transportation must be provided forward from the pipehead.

These four conditions may be said to be the principles of movement control, since they are fundamental to the full efficient use of the lines of communications. They are also interrelated and complement one another. They can only be applied if there is centralized control at a level high enough to give the movement control staff jurisdiction over both the operator and the user of transportation.

### Centralized Control

Only by centralized control at a level above the operators of transportation can the movement control staff "designate the means of transport to be used." Only by centralized control at a level above the users of transportation can this staff require the "full use of carrying capacity." Only by centralized control at a level where the plans for the distribution system and the development of lines of communications are made can an "even flow" be achieved. Only by centralized control at a level above both the operators of transportation and the commanders of the various areas can there be achieved "inte-

gration of all means" from source to designation. Since centralized control and decentralized operations are the goal, it is only by establishing the control at sufficiently high level that we can ensure the necessary coordination between the decentralized operators.

Once we acknowledge that movement control must be centralized at a high level, we are squarely up against the problem of organization. This includes the problem of determining whether movement control is a general or special staff function and the level of command in the theater from which it will be exercised.

### British Organization

The British Army, which has developed movement control to a very high degree, considers movement control to be a general staff function. In their organization, the British separate the transportation function from the movement control function completely. Transportation is operated in a theater by the Royal Engineers and the Royal Army Service Corps, while movement control is performed by a Deputy Quartermaster General (Movements)—called Q (Movements). Thus, the British have the equivalent of a Deputy Theater G-4 as their movements officer. Under Q (Movements), and acting for him, are Q (Movements) staffs and movement control officers at the various subordinate levels of command. These movement control officers are field agents of Q (Movements), and as staff officers they are able to speak with the authority of the theater commander. Thus, this organization provides for very tight centralized control and supervision over all movements. At the same time, it allows decentralization to subordinate commanders of the operations of both the users and operators of transportation.

### United States Organization

In contrast to the British system of movement control, the United States Army does not have a true movement control staff. The functions performed by the British Q (Movements) are divided between the G-4 and the transportation officer in the United States Army.

G-4 is responsible for the assembly of requirements, the allocation of transportation, and the establishment of priorities. The transportation officer is responsible for developing a movement plan designating the mode of transport to be used, based on the allocations of transportation and the established priorities. After the movement plan is approved by the G-4 for the commander, the transportation officer is charged with the execution of the plan.

This system has certain disadvantages in that the movement planner is not represented on the general staff, and consequently transportation requirements and considerations may not be given the attention they deserve in the planning of operations. This can and has resulted in the transportation service being faced with a task which is either impossible of execution or extremely wasteful of the limited transportation capacity.

On the other hand, this system has certain advantages, particularly for the American type of organization. The coordination between the movement control personnel and the operating personnel is very apt to be much better, since both belong to the same service and are supervised and directed by the same general staff section. Also, since the transportation service is charged with both developing and executing the plan, there is less likelihood that an unworkable plan will be developed or that its execution will be poor.

With centralization of movement planning (subject to approval by the commander) and execution under the transportation officer, we have satisfied the principles of movement as far as central-

ized control is concerned. The remaining question is: At what level should this centralized control be exercised so as to provide jurisdiction over both the operator and the user of transportation? In the British system, control is exercised at theater level by the Deputy Quartermaster General (Movements). In our own system, the commander delegates the control of the operator to his transportation officer, who is also the movement planner. Movement jurisdiction as regards the user is the only remaining point.

### Present Doctrine

Current doctrine in the United States Army is that the transportation officer, Communications Zone, is the chief operating officer of the military transportation service. This is a logical arrangement from the point of view that the Communications Zone is charged with providing full administrative and logistical support for the Army forces in the theater. The transportation officer of the Communications Zone has operational control of the intersectional transportation services, such as the military railway service, highway transport service, and inland waterways services. Although the transportation officer does not operate pipe lines or air transportation, he is charged with planning for and coordinating the use of pipe line and air transportation with other means of transportation.

However, there is normally a transportation officer on the special staff of the theater Army commander. We therefore find ourselves faced with the awkward situation of having a theater transportation officer on a level where all users can be coordinated, while at the same time the Communications Zone transportation officer is the movements planner who should be in a position to coordinate both the user and the operator.

A practical solution to this problem in the past has been to designate a single officer as both the Communications Zone transportation officer and the theater Army transportation officer. Requiring a staff officer to serve on the staff of two or more commanders obviously has its organizational disadvantages. The greatest weakness of our present movement setup is the lack of a clear-cut channel of communication and control and the lack of a clear-cut organization. The transportation officer at a subordinate level, such as a base section, has two masters. He is a staff officer on the staff of the base section commander, and at the same time he is a field representative of the transportation officer of the Communications Zone for the execution and police of the movement plan. Many conflicts arise from this type of organization.

Further, the transportation officer, or his representative, the railroad transportation officer at an installation, has no real authority to insure that the users will abide by the movement plan. During the mounting of the invasion force in England, many unit commanders refused to move in accordance with movement instructions transmitted through movement channels. The resulting delays threatened disruption of the entire movement plan which had been carefully worked out to fully utilize an overburdened transportation system. Only after General Eisenhower published an order authorizing the individual railroad transportation officer to speak for him, the theater commander, was the problem solved.

### Summary

From this discussion, it should be clear that in spite of the lessons learned during World War II our movement organization and technique have not yet reached perfection. Much remains to be done. All users must be indoctrinated with their responsibilities in connection with full utilization of transportation. The users of transportation must learn the following if

the transportation system of a theater of operations is to support fully the military operation: (1) that they are obligated to provide accurate estimates of their transportation requirements; (2) that they must conform to the movement plan as developed; and (3) that they must load and unload their shipments promptly. Equally important is the establishment of the movement control organization on a sound footing at a sufficiently high level of command.

One suggested solution has been the establishment of movement control as a separate intersectional service at theater level. This would overcome some of the weaknesses of our present arrangement. The whole problem certainly warrants serious study and the development of a sound solution, if we are to avoid the improvisations and mistakes of the past.

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**The problem of transportation is a continuous problem. This has always been true. Each century has seen the outmoding of transportation facilities termed the most progressive in the preceding era. So the transportation facilities which served us well in World War II are today being re-examined and reshaped, developed for tomorrow's demands.**

*General Jacob L. Devers*

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**To state that military strategy is dependent upon transportation is almost a platitude. One of the main objectives of any commander in chief is to cut the communications of, and deny the use of bases to, his opponent; and conversely to secure and develop adequate communications for his own armies.**

*Brigadier R. F. O'D. Gage*, Great Britain

# How Far Along Are We in Developing an Airborne Army?

Lieutenant Colonel William A. Kuhn, *Infantry*
Instructor, Command and General Staff College

**"Lighten the soldier's load, and at the same time decrease the weight of his supporting guns and their ammunition—and we may in the sum total, provide, through research and careful development, an airborne Army."**

General Omar N. Bradley, in an address to the graduates of the Command and General Staff College, 1 July 1949, Fort Leavenworth, Kansas.

HISTORICAL examples of airborne operations conducted during World War II were close, vertical envelopments by parachute and glider forces or air-landings in enemy territory. These operations were in direct cooperation with surface action of other ground forces which linked up quickly with the airborne units.

In the few years since VJ-day, the airborne picture has considerably changed. Only specialized airborne units were initially concerned with this type of warfare; now every army unit is becoming vulnerable. The favorable trend in developments of cargo type airplanes and the improved loading facilities which are being incorporated into these airplanes has provided an alternate method for transporting troops to areas of disturbance.

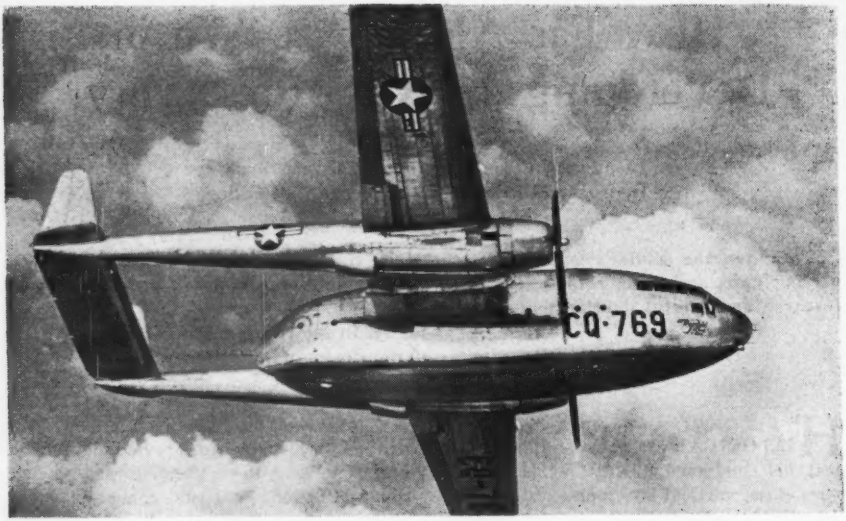
The planners of today are thinking in terms of airheads established entirely by airborne and air-transported corps equipped with air-transportable howitzers, tanks, bulldozers, and other essential weapons and vehicles. They visualize using the pod or pack-plane to provide detachable units enabling the airhead to set up field communications stations, command posts, control towers, hospital units, shelters and supply warehouses, all delivered by air.

### Carriers for an Airborne Army

Transport type aircraft which are currently included in the development program and approach the desirable military characteristics as carriers of an airborne army are:

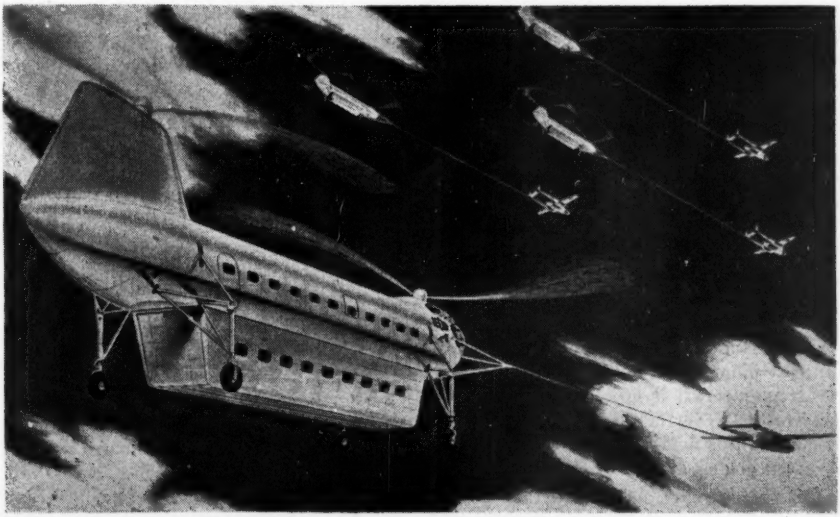
1. The C-119, a medium cargo type airplane, is intended for use as a parachute, glider tug, or air-landing airplane. It has exits, in addition to cargo doors, to permit rapid discharge of parachute troops and accompanying supplies. This plane will transport all items of equipment included in the standard infantry division with the exception of tanks, the antiaircraft armament, and some of the heavier engineer equipment. This airplane possesses practically all of the ideal military characteristics of a medium cargo plane.

***Military planners today are thinking in terms of airheads established by airborne and air-transported corps, equipped with air-transportable weapons and vehicles and maintained by fleets of transport aircraft***




Many new types of aircraft are being developed and tested as the carriers of an airborne Army of the future. Above, the C-119 medium cargo plane, which carries 42 troops or a 2½-ton truck and a 105-mm howitzer. Below, the C-124 long-range heavy cargo plane, which carries 222 troops or one light tank, M-24.—US Air Force photos.

Above, the C-123 medium assault cargo plane is designed to carry 60 troops or a 2½-ton truck and a 105-mm howitzer. Below, the H-16 large transport helicopter with detachable pod is capable of carrying 3 to 4 tons of cargo or 40 troops. The detachable pod idea is also being adapted for use with conventional aircraft.—US Air Force photos.



2. The C-124, a heavy cargo type airplane, is intended primarily for air-landing operations with secondary employment as a parachute or glider tug airplane. It has parachute exits as well as cargo doors. This plane will not carry the medium tank; however, it will lift the light tank. All other heavy items of equipment contained within the standard infantry division can be lifted by this plane. One of the primary disadvantages of the C-124 is that heavy cargo drops have been sacrificed in order to obtain nose loading.

3. Assault cargo aircraft are intended for use as parachute or assault landing airplanes, using small fields normally suited to cargo gliders. Both parachute exits and cargo doors are included in these airplanes. The assault cargo airplane is designed to eventually replace the glider. This type of aircraft includes the C-122, C-123, and C-125, all of which will lend a great deal of versatility to the employment of airborne or air-transported forces at relatively close radii of action.

4. An interesting development in aircraft is the cargo helicopter. The H-16, a combination cargo-troop carrier, and the H-17, primarily a cargo carrier, will tremendously increase the flexibility of amphibious, river crossing, mountain, and other special operations. Military planners also visualize using helicopters for movement of bulk cargo and supplies within an airhead or a similar isolated area.

### Airborne Problems

It must be understood, however, that airborne forces possess certain inherent weaknesses which are due partially to the cargo versus distance limitations of present-day cargo airplanes. The development program for cargo aircraft is progressing very satisfactorily. Nevertheless, much remains to be done in this field. Some of the more apparent problems are:

1. Landing gear; perhaps further development of the track-laying type will reduce requirements for prepared landing fields.

2. Shortening landing and take-off ability.

3. An improvement of glider tows.

Neither the Army nor the Air Force planners minimize these problems.

Needless to say, the future employment of airborne forces will be greatly enhanced by the continued development of more efficient transport type aircraft. The Berlin Airlift proved conclusively that movement of large cargo tonnages, entirely by air, is not only feasible but an acceptable method of transportation. The average cargo tonnage delivered per day by the Airlift during the spring of 1949 approached 8,000 tons per day.

Heretofore, the logistical considerations involved in large airborne operations have tended to restrict the possibilities for this type of warfare. Some military writers have not only soft-pedaled academic employment of large airborne forces, but they have declared them to be impossible. However, by virtue of aircraft developments, particularly in assault type aircraft, medium and heavy cargo aircraft, and helicopters, it is mandatory that we explore and determine the feasible scope and scale of this type of military operation.

### Employment of Airborne Forces

The establishment of an airhead by an airborne force, deep in enemy territory, is a comparatively new concept, and offers significant possibilities which are worthy of consideration by the military student. To fully appreciate the possibilities of this type of operation, we must first accept the fact that large airborne operations are an existing military potential of our country. The large airborne operation may be the only, and in some situations the most economical, means by which certain missions can be accomplished. In any case, fully equipped airborne forces will be able to strike at far distant points and

will be totally supplied by air. Furthermore, the Army must be prepared to participate in and ready to shoulder the responsibilities involved in the execution of such operations.

Potential airborne operations comprising parachute-glider troops and air-landed troops can be classed into four fundamental categories:

1. The first type is the use of large airborne forces in the establishment of an airhead deep in enemy territory. This category contains two further ramifications which are:

a. Employment of a large airborne force, contemplating a link-up with conventional land forces after an extended period of operation.

b. Employment of a large airborne force on an independent land mission sustained entirely by air transport.

2. The second type of employment of airborne forces involves a relatively early juncture with other land forces. This type of mission will normally be in support of the over-all ground mission and closely coordinated with that effort.

3. The third type of airborne operation is the employment of airborne forces to seize a base which will provide facilities for the furtherance of a common mission for the same or another service.

4. The fourth type of airborne operation is the employment of airborne forces to neutralize enemy installations which do not present suitable targets for complete destruction by combat air operations alone. This type operation takes the form of a raid with detailed plans for withdrawal of the force after accomplishment of the mission. Withdrawal plans may include a getaway by air, sea, overland, or a combination of all three.

An airborne force landed deep in enemy territory and constituting an independent invasion is capable of delivering tremendous shock and striking power. Accordingly, unless the military planners whose task it is to formulate long-range outline war plans include provisions for adequate transport aircraft of suitable size, range, and speed, large airborne invasions will not be possible. Moreover, the operational planner and the procurement planner, on the national level, must integrate their planning efforts to such an extent that the operation plan is in essence married to the procurement plan. During World War II, the air war was virtually won in the spring of 1944. However, the procurement schedule for bomber type aircraft continued at the same tempo throughout that year and the following year. Had the procurement planners and the operational planners foreseen this situation, it is logical to presume that the bomber schedule would have been decreased and the cargo aircraft procurement schedule stepped up.

Relying upon the sound professional judgment of those individuals in whom rests the responsibility for our military destiny in the event of future war, we can assume that the necessary tools will be available to support large airborne operations. What, then, is the Army's responsibility in the execution of this type mission?

### Capabilities Required

Before considering this question in detail, it is necessary to survey the capabilities that must be possessed within the military structure of the Armed Forces in order to achieve success in the establishment of an airhead deep within enemy territory.

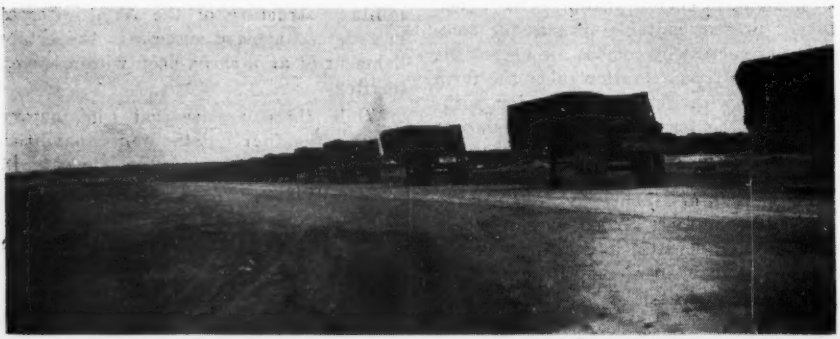
While there are several contributory factors, the four outstanding capabilities which must be possessed by the Armed Forces are:

1. Such operations are not feasible until the Air Force has gained and is able to maintain air superiority.

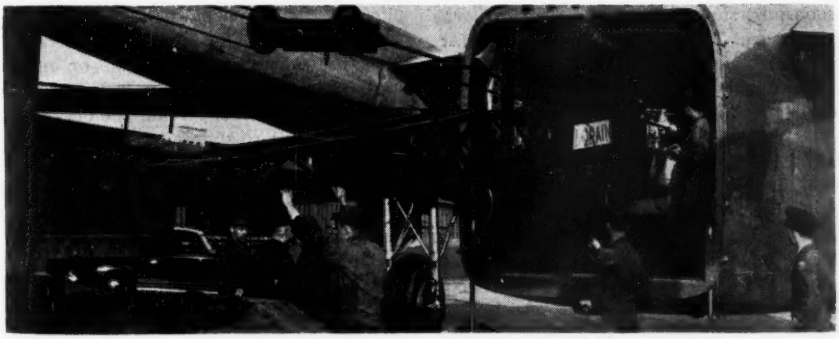
2. The operation must achieve strategic and tactical surprise.

The Berlin Airlift was a proving ground for many airborne principles. Above, supplies being unloaded at a Quartermaster Depot in Germany for air shipment to Berlin.

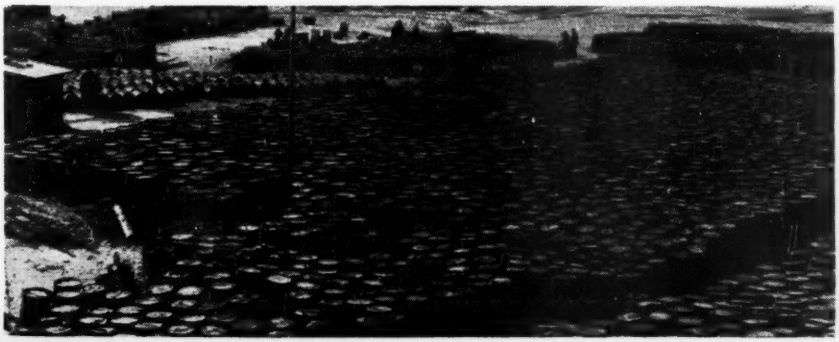
Above, coal sacks, used for packaging fuel for Berlin being loaded on trucks at Rhine-Main. Below, supplies on trailers at Rhine-Main, awaiting shipment to Berlin.—US Army photos.



**At the Berlin end of the Airlift, experience was gained in the mass unloading of aircraft. Above, coal being unloaded from C-54s at the Gatow Airfield.**



**Above, heavy equipment being unloaded at Templehof from a C-82. Below, some of the supplies flown into Berlin to construct a runway.—US Air Force photos.**



3. The ability to launch an assault of airborne forces capable of overwhelming the enemy in the locale of the airhead.

4. The airborne force must be capable of establishing and maintaining a greater build-up of troops, equipment, and supplies than the enemy is able to bring against the airhead.

A quick analysis of these four salient capabilities reveals a complete dependency upon air transportation and air protection in each of the four. This, again, emphasizes the necessity in long-range planning for airborne operations of large-scale variety.

From strictly an Army point of view, there are two prime responsibilities involved in supporting large-scale airborne operations. The first responsibility is far-reaching and one that must be decreed by Department of the Army policy. This is the degree of air-transportability to be obtained by every unit presently contained in the type field army. Any unit in the field army that is essential for combat, combat support, or service support of an operational force, but which cannot be transported by prospective aircraft, has no justification for continuing in its present form. The development of Maginot Line type of armor and armament for army purposes is not only planning in retrospect but is as archaic as the catapult. World War II was a war of movement, primarily surface movement. However, it requires no great amount of speculation to conclude that World War III will be a war of movement in space, depending upon surface movement for the necessary support in the accomplishment of strategic missions. The Trojan horse for the army of the future will be the cargo-troop carrier airplane.

The second responsibility of the Army in supporting large-scale airborne operations calls for the development of procedures, doctrine, and a command structure for the logistical support of forces in the airhead. Many sources of information are available for constructive thought and guidance in this development. The most excellent source currently available is the record of the Army's functional responsibilities in connection with the Berlin Airlift.

### Logistical Support for the Airhead

Before considering certain aspects of the Berlin Airlift, it is appropriate to scan briefly the present concept of providing logistical support to an airhead. Present doctrine accepted in army service schools states that an air cargo re-supply organization, an Air Force service unit, will be present on departure airfields to receive, store, classify, pack, and load all supplies for air shipment forward to destination airfields. The supplies are received from the Communications Zone or one of its sections which has been delegated the responsibility of supporting the operation. The air cargo re-supply organization is a cellular organization composed of a headquarters and from one to eight re-supply teams. These service units are located at designated departure airfields and perform the functions for which they have been designed. In exceptional cases, this organization will assist unloading air cargo from airplanes in flight.

Obviously, the doctrine regarding the air cargo re-supply organization is a holdover from procedures developed during World War II. It was envisioned that this organization would be capable of handling air supply but would not be resorted to until other supply means failed to meet the requirements. In other words, this is a specialized Air Force unit, interposed in the supply pipeline between an Army service force in rear areas and the Army operational force in a forward area or airhead.

Within the several theaters of operations, in the last War, air transportation of troops, supplies, and other items played various roles of importance. Never-

theless, the over-all tonnage handled by the conventional means of transportation completely overshadowed the air transport effort. With the advent of larger cargo airplanes, both under production and in drawing board stages, it is obvious that air transportation will play a major role in any future conflict.

### What Must Be Done

The logical question at this point is: "What must be done in order to facilitate the handling of large tonnages of supplies that will be funneled through departure airfields of the future?" This problem is not one that can be solved merely by stating that when the time arrives we will be able to handle the situation. Research and planning must be conducted in order to produce sound and reliable procedures, doctrines, and techniques.

The Berlin Airlift has provided a proving ground for procedure and techniques in handling air movement of cargo from departure airfields to destination airfields. Army participation in this operation has equaled the magnitude of the participation of the Air Force. Untold difficulties have been encountered by the Air Force in solving problems of air traffic, maintenance of operational aircraft, and the struggle in balancing trained personnel requirements. However, the Army also has been burdened with equally difficult problems as reflected by typical Army activities in connection with the Airlift.

From the initial days of this operation, the Army was charged with the responsibility for receiving supplies to be moved forward to Berlin. This included handling such supplies from the railhead to the door of the cargo airplane. The plane was loaded by indigenous laborers under supervision of Army personnel. Air Force personnel supervised the placing of cargo in the plane in order to insure safe load and balance requirements for safe flight. Unloading and handling of cargo at the terminal airfields in Berlin was totally an Army responsibility.

Coordination of Army participation in the Airlift until March 1949 was executed by the general staff divisions of the European Command. Primary interest fell to the Logistics Division, with the Chief of Transportation being the operator. This system of command and control of functional organizations proved to be awkward and cumbersome to the extent that efficiency of Army participation was being jeopardized. Top Army officials, realizing the precariousness of the situation, organized a new command with centralized control, which included all of the United States Army elements working in direct support of the Berlin Airlift operation. This was definitely a step in the right direction and one that should be fully explored with intent of determining the degree of applicability of this command to similar operations.

Obviously, the Berlin Airlift cannot be compared with a tactical airhead deep within enemy territory. This operation, however, can be analyzed, and the procedures, doctrine, and techniques that have been developed can be applied to the air movement of cargo from the Zone of Interior to an overseas theater of operations. The same developments can be applied to the support of ground combat operations within a theater, particularly under the dispersed situations which will be prevalent in a future war.

### Conclusions

It has often been said that there is very little new in the basic principles of warfare, though the forms of it change. Nevertheless, there can be no doubt that success in any future conflict will depend largely upon the means available and the degree of mobility attained by our Armed Forces. The Army must intensify the research and development program with special emphasis on the production of arma-

ment and equipment for the Army which is entirely air transportable. The objective of this program cannot be beamed at a goal that is 10 to 15 years in the future; it must be gained in 3 to 5 years at the most.

Providing the Army with the tools needed to accomplish airborne missions is not the end but a means to the end. Being able to sustain logistically an airborne force is of equal importance. The ablest military planners in conjunction with civilian specialists should conduct unprejudiced and comprehensive analysis of present and proposed methods of maintaining airborne air-transported forces in areas under probable future combat conditions. The resultant conclusions and recommendations of such research should then be field tested and the final technique and procedure disseminated throughout the military establishment.

Concurrent with the research and development program, the Army must state a minimum requirement for cargo-troop carrier aircraft based upon the transport planes required to air lift a standard infantry division. This requirement is not intended to build up a pool of airplanes resulting in a moth-ball fleet, but will provide sufficient transport aircraft for air-transportability training purposes and at least an M-day nucleus of planes for strategic air movement of Army troops.

Moreover, it is important that we explore our military potential; it is tangible and can be measured; it is present in peace and war alike. Finally, cognizance should be taken of the situation and thereby determine just how far along we really are.

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**Premised on the belief that subsequent hostilities in which the United States may become involved will occur so rapidly as to preclude a long interval of time in which to make preparation, it is believed that the postwar role of airborne forces should include such an organization as will permit the immediate and rapid employment of airborne forces on either a tactical or strategic mission.**

*Major General E. G. Chapman*

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# DEVELOPMENT OF THE VICTORY PROGRAM OF 1941

Mark S. Watson
Historical Division, Department of the Army Special Staff

*This is the second of two articles on the Victory Program of 1941 from Chapter XI of Mr. Watson's forthcoming book entitled* The Office of the Chief of Staff: Prewar Plans and Preparations, *in the series,* The U. S. Army in World War II. *Copyright 1950 by Orlando Ward; permission for reproduction may be obtained on request from the Chief, Historical Division, Special Staff United States Army, Department of the Army, The Pentagon, Washington 25, D.C.—The Editor.*

## Part II

PRESIDENT Roosevelt's memorandum of 30 August 1941 to the Secretary of War called for a large addition to the already large requirements of the 9 July directive, itself not yet satisfied, and also a firmly set date of accomplishment. The information upon which these additional Russian requirements could be computed was fragmentary, and it does not appear that they entered into WPD calculations at this time seriously enough to effect any change in the figures of the Victory Program. They became a large factor in the later computations for Lend-Lease and, hence, for over-all production.

### Navy Requirements

On 5 September, the Navy Department, which up to the date of the 30 August letter does not appear to have offered any active cooperation in the joint enterprise directed by the President 8 weeks earlier, presented its own 16-page estimate of ultimate requirements from the somewhat oblique approach of a "Proposal for the National Defense Policy of the United States." Examination of it by General Gerow led the WPD Chief, while agreeing with some of the Navy statements, to the opinion that "much of it is not responsive to the President's directive" and to the belief that he and Admiral Turner, the Navy's WPD Chief, should hold a conference without delay.

A revised Navy draft, dated 9 September, was then sent to the Chief of Staff, and was immediately and critically examined by WPD with a view to advising General Marshall on his answer. Both General Gerow and Major Wedemeyer expressed concern that the Navy statement which on one page explicitly recognized that "only land armies can finally win wars" proposed on another that the Allied land armies to be pitted against the Germans on the Continent of Europe

***The American Victory Program of 1941 had sought an orderly basis for matériel planning, but swift changes in international affairs and the coming of war required planning on even a greater scale by early 1942***

should be inferior by a ratio of one to five.

General Marshall found numerous other objections to the Navy paper. On the very morning when the joint paper was due at the White House, he wrote Admiral Stark with an unusual touch of acerbity, listing a dozen points of disagreement, notably with the Navy paper's paragraph touching the tender issue of how to employ Army munitions. In this, General Marshall wrote that he had noted

> . . . many suggestions that we should arm or help to arm the British, the Russians, the French in North Africa, as well as China, the Netherlands, East Indies, and Malaya. While agreeing in general that we should aid where we can, I believe that such broad statements may give the President an erroneous idea of the amount of aid which we can offer and might lead to commitments which would seriously impair the efficiency of our own forces. Furthermore, in this paragraph the suggestion is made that a large proportion of the troops of the Associated Powers employed in North and West Africa should be supplied from the United States. This statement seems rather premature.
>
> . . . [as to Paragraph V] the War Department has been engaged in the study of the Army forces required, for the last 2 months. I feel that in the matter of Army forces the Navy should accept the Army studies to the extent that we accept the Navy statement of requirements, recognizing that the Navy is the expert so far as naval matters are concerned.

The Chief of Staff added pointedly that he was enclosing a copy of WPD conclusions in which "the purely naval requirements . . . have not been included." He proceeded: "It seems to me that we should submit our respective requirements to the President at an early date with a simple statement as to how they were determined." Indeed, there now was no time for a considered agreement of Army and Navy, if the delivery date specified by the President was to be met.

On that same morning, with Mr. McCloy pressing for delivery of the Army's section of the voluminous report, General Gerow completed his memorandum to the Chief of Staff, to accompany Major Wedemeyer's exhaustive study. He cited the President's letter of 9 July and the memorandum of 30 August directing report by 10 September, cited also the steps taken to comply with both directives, and offered some conclusions which he apparently felt should be emphasized for the attention of higher authority.

### WPD Conclusions

A significant item was that "Ultimate victory over the Axis powers will place a demand upon industry which few have yet conceived. There is no easy or short method of defeating our potential enemies." He mentioned that "discussion with the Navy, with a view to reconciliation of conflicting views, is now being carried on" and recommended that (this day being the date set by the President for completion of the report) the Secretary of War approve the accompanying statement of Army critical items, for later inclusion in a joint Army-Navy report, the Navy's part not being on hand then.

To this voluminous set of documents and exhibits, the Chief of Staff appended a hastily penned note to the Secretary of War, dated September 10, 5:30 p.m.; "General Gerow is now—at this hour—in consultation with Admiral Stark. I have not had time to examine these proposals. They are submitted herewith." With the original of this note in the records is filed a penciled note from "A.C.W." (Major Wedemeyer), dated 10 September 1941, 10:15 a.m., and reading: "Copy with complete set of Tabs taken personally by Col. Bundy to Chief of Staff's office. The Chief of Staff did not have time to review the complete study. However, Col. Bundy was given permission to deliver same to Assistant Secretary of War (Mr. McCloy) who wanted the data immediately."

It would appear that the Chief of Staff, meeting as well as possible the President's direction to have the study ready on 10 September so far as the Army's part was

concerned, purposely avoided accepting personal responsibility for that portion until he could reach with the Navy an agreement on the entire joint statement. So far were the two services from agreement that when (on 25 September, 15 days behind schedule) the joint letter of explanation from the Secretaries of War and Navy was finally delivered to the White House, it was accompanied not only by a single Joint Board report but also by estimates of three separate "ultimate requirements," for Ground Forces, Air Forces, and Navy. The carefully considered study of WPD was necessarily a long document, and next day the Secretary of War reported wryly that the President was not disposed to read the entire bulky assemblage of papers at one time; what he kept for immediate perusal was not the painstaking Army discussion but the shorter reports of the Joint Board and the Air Corps.

The Secretary, it must be understood, was no mere official agency of transmission for this study. The President's specific instructions had been addressed to him, both on 9 July and 30 August. Before his compliance on 25 September with these instructions, Mr. Stimson discussed with his advisors the resultant Victory Program and its accompanying reports and also the issues of strategy and policy involved. At these conferences of 16-17 September were Assistant Secretary McCloy, Harvey Bundy of the Secretary's Office, General Gerow, and Major Wedemeyer.

In the interval between 17 September and 25 September, Mr. Stimson completed and presented to the President his own work on the Anglo-American Consolidated Statement, the fruit of the ancillary inquiry of this period, designed to show by accepted official totals the stocks of war material as of 30 June 1941 and the expected quarterly production from the plants of the United States, Canada, and Great Britain until December 1942. This was presented on 23 September, 2 days before Mr. Stimson and Colonel Frank Knox, Secretary of the Navy, presented the Victory Program and its accompanying papers.

### National Policy Objective

Essential to beginning compilation of the Victory Program's estimate of requirements had been a statement of the national policy's objective, for without a knowledge of the desired end there could be no intelligent determination of the means to attain it. But in July 1941, the Staff planners still possessed as their official guide only that "more or less nebulous" policy of which General Gerow had complained.

It remained, therefore, for the Staff to project its own clear statement of a strategic concept. This would be the hypothetical policy to support which Major Wedemeyer could then address himself. Of the early steps taken in the Staff to draft that initial policy statement, the record thus far examined is barren, but they can be easily conjectured. The routine of General Staff procedure would have called for extended consultations of the Chief of Staff with WPD; a resultant outline to the planning agent of WPD (in this case Major Wedemeyer) of the various items to be incorporated in such a statement; the planning agent's development of the outline into an ordered and complete statement; his reference of this statement to his immediate chief and to other Staff divisions for criticism; his revision of the original as needed; his resubmission of the document to his chief and, eventually, to the Chief of Staff.

Certain of these conjectured steps are in fact visible in the record. They disclose the preparation in chart form of an initial "Brief of Strategic Concept of Operations Required to Defeat Our Potential Enemies" not later than 31 July 1941 and its examination in ensuing days by G-1, G-2, and G-3, whose chiefs returned the chart with their comments. Criticisms were so

few as to suggest that the items had previously been discussed orally and already adjusted to Staff views. This chart's explicit assumptions dealt with items of national policy in plain rather than "more or less nebulous" terms, unquestionably in so grave a matter by Chief of Staff directive.

### Assumed National Policy

These were the boldly stated assumptions of national policy:

*Monroe Doctrine.* Resist with all means Axis penetration in the Western Hemisphere.

*Aid to Britain.* Limited only by US needs and abilities of the British to utilize; insure delivery of this aid.

*Aid to other Axis-opposed nations.* Limited by US and British requirements.

*Far Eastern Policy.* To disapprove strongly Japanese aggression and to convey to Japan determination of US to take positive action. To avoid major military and naval commitments in the Far East at this time.

*Freedom of the seas.* The United States would permit no abridgement.

Eventually the US will employ all armed forces necessary to accomplish national objectives.

The principal theater of operations is Europe, but other possible theaters may later appear desirable.

The defeat of our potential enemies is primarily dependent on the defeat of Germany.

Field forces (air and/or ground) will not be prepared for ultimate decisive modern combat before July 1 1943, due to shortage of essential equipment.

The chart recommended three phases of American activity, with definition as to time and objective, as follows:

1st Phase—(Until M-day or when hostilities begin). Objective: Insure delivery of supplies to the British Isles and provide munitions for other nations fighting the Axis, in order to preclude a diminution of their war effort and concurrently to prepare US forces for active participation in the war.

2nd Phase—(M-day until prepared for final offensive action). Objective: Prepare the way for eventual defeat of Germany by active participation as Associate of Great Britain and other nations fighting the Axis powers.

Final phase. Objective: Total defeat of Germany.

### Ultimate Requirements

If the chart's Strategic Estimate was necessary as a preliminary to developing the Victory Program's estimate of production, a corresponding study was felt to be equally necessary to explain that "Statement of Ultimate Requirements." The original strategic concept, therefore, was revised by WPD from day to day to 24 September when it was ready for Secretary Stimson's approval, whereby it could take cognizance of such current events as the Atlantic Conference and the ominous developments in the Pacific. Thus, the group of documents which was given to Mr. Roosevelt on 25 September contained not only an elaborate chart of production needs (his specific requests) but a complete statement of the Army's views on strategy in that tense autumn. It is the most searching of the strategy statements up to that time and, while it was textually prepared by WPD and so accredited, it must be recognized as the considered view of the Chief of Staff whose responsibility it was. The document may be summarized as follows:

The United States must be prepared to fight Germany directly and defeat her, conscious that Germany and the satellite states now have 11 million soldiers in 300 equipped and trained divisions and by 1943 can have 400 divisions in the European theater. This means that the Allies must have air superiority and a strong sea force; that the United States must create production capacity to provide for

a. An appropriate force to defend the Western Hemisphere.

b. Task forces for operations, primarily in the European Theater.

c. Supplies for friendly powers.

The United States must consider where, how and when its means will be used.

*Where?* In Central Europe (which will be decisive) but possibly also in Africa, the Near East, the Iberian peninsula, the Scandinavian countries, the Far East.

*How?* By sweeping the Axis navy from the sea; by getting overwhelming air superiority; by destroying German economy and industry (lines of communication and ports and industries); by reducing the German military forces' effectiveness by causing shortages and chaos and by lowering popular morale; by maintaining the security of the British Isles and the Near East and using them as bases, and by getting more advanced bases by con-

ducting an offensive in Europe and a defensive in the Pacific.

*When?* First, count upon a lag of 1½ to 2 years between planning and execution. Second, accept the possibility of Russia's defeat west of the White Sea-Moscow-Volga Line by July 1942 and Russia's resultant military impotence; recognize that Germany would then need a year to restore order. The Allies' timetable would be affected by Russian events, in that so long as Russia could hold German forces in the east, Germany would suffer from prolonged attrition, and there could be an intensification and an extension of Allied efforts. If during this space the Allies could accumulate enough strength to seize new military bases for later air and ground operations and for some immediate air activities, the desirability of that step is obvious, but the American forces would not soon be ready for a timely offensive of any size. There must, however, be a great acceleration of production for Britain and for the ultimate American offensive, for which 1 July 1943 remained the target date.

In estimating the capabilities of the belligerents, it was assumed that Russia would be rendered impotent; that the Axis would be weakened by blockade, by losses in Russia, by British sea and air operations, and by lowered home morale; that Japan would be fully occupied with a strengthened China, plus a fear of Russia in Siberia and a threat of reprisal from Britain and the United States; that Britain would strengthen; that France would remain passive; that the Mediterranean would remain in dispute; that the United States would become an active belligerent.

The estimate's assumptions recognized that, besides bases in the British Isles and the Near East, others must be acquired in the Scandinavian or Iberian peninsulas or in Northwest Africa.

Conjectures upon the weight of manpower needed started with surmise that the Axis in July 1943 would have 400 divisions, and that the Allies, excepting the United States, would have 100—so that a 2-1 attack ratio would call for the impossible figure of 700 American divisions, or 22,000,000 men. This historic 2-1 concept was therefore dismissed from consideration. It was noted that mere numbers of men may not be as potent as machines and blockade, that another million men would hardly have saved France, and that Russia's actual superiority in numbers had not yet saved her. The concept was, therefore, to surround the Axis with fewer men, but to use them in locally powerful task forces and to advance step by step. They might be used in North Africa, the Middle East, France, or the Low Countries, or in all.

Shipping was recognized as the bottleneck, and the Victory Program called for early application to that need. To move 5 million men overseas would probably require 7 million tons of shipping (1,000 vessels), but the 2 years needed to build such a fleet would also be needed to build such a force of men. It would be "folly to prepare forces without transport to move them."

## Joint Board Report

The Joint Board report (which, rather than WPD's extended statement, Secretary Stimson said had engaged the President's immediate attention) undertook to reconcile the Army-Navy differences and, failing in one large instance, summarized separately the views of the services on that issue. Its broad conclusions, in some important items supplementing those of the Army document, may be summarized as follows:

National objectives, as related to the military situation, called for (1) preservation of integrity of the whole Western Hemisphere; (2) prevention of disruption of the British Commonwealth; (3) prevention of further extension of Japanese dominion; (4) eventual reestablishment in Europe and Asia of a balance of power furthering political stability in those regions and future security of the United States; (5) establishment, as far as practicable, of regimes favorable to economic freedom and individual liberty.

It was fundamental that the United States provide armed forces which in all eventualities could prevent the extension of alien power in the Western Hemisphere "even though the British Commonwealth had collapsed." The objectives listed could be gained only by military victories outside this hemisphere, whether by US forces or by those friendly to the United States.

The estimate of belligerents' capabilities was followed by a judgment that Germany could not be defeated without American aid to the anti-Axis forces and, likewise, that should Japan advance toward the Malay barrier, the movement could not be resisted by British or Dutch without American aid. For that reason, the Joint Board recommended a production objective designed to meet the needs of the United States while engaged simultaneously with Germany and Japan, with or without the continued participation of the 1940 opponents of the Axis. Also, it recommended that the production objective include needs

of friendly powers likewise engaged against the Axis.

The first military objective was held to be the total defeat of Germany, even if meantime Britain and Russia should collapse and thereby add to the strain upon American resources. Recognition of this as the main objective dictated the need of material support meantime in all operations against Germany and called for reinforcement of those operations with American units whenever possible. Naval and air contributions being all that was currently available, these contributions should be made, but with recognition that almost invariably "only land armies can finally win wars." For the present, the contributions would have to be in the forms of maintaining the blockade, prosecuting warfare in those areas where German land resistance was weak, and supporting subversive activities. Europe, patently, would ultimately be the chief theater, but "invasion by the United States of Germany will not be attempted until the air offensive against Germany has been successful and we can control the air over the area of the invasion to a very large measure."

The one insurmountable obstacle to Army-Navy agreement sprang from Navy hostility to the Army's flood of munitions orders. It was temporarily disposed of by a paragraph reciting the Navy view that, because of limited ground force strength, strategy should make full use of naval and air force resources; the opposed Army view, also recited, was that naval and air attacks admittedly could not defeat Germany, and hence land strength for the ultimate battle on the continent of Europe should be provided.

### "October Estimate"

In October, WPD issued another Strategic Estimate of the situation, following the conventional staff procedure of submitting to other Staff sections an initial draft for criticism. Its purpose, beyond the obvious aim of providing a new current estimate of the situation, would appear to have been to press the Army viewpoint which the Navy was not yet quite ready to accept, for it emphasized the WPD wish "to determine . . . the most profitable lines of action for the employment of our military potentials" in order to pursue present national policies. The measures to be taken to that end were listed: to enforce the Monroe Doctrine; to contribute in any way possible to the defeat of Germany, short of declared war; to assist all peoples opposing the Axis Powers by providing munitions; to uphold the American doctrine of freedom of the seas; and to discourage Japanese aggression.

The situation estimate was pessimistic. WPD still expected the liquidation of Russia in early 1942, followed by German peace overtures to Britain and, these failing, a full assault on Britain at home or in the Mediterranean. Japan's bellicosity would reflect the degree of German successes. British defeat was now regarded as probable unless the United States should provide support by military forces. Victory, even with American help, was thought unpredictable because of the uncertainty about Russia's future, for German conquest of Russia would be followed by a rehabilitation of Europe and the Middle East, which in time would enable the Axis to defy the British blockade.

Hence, WPD now recited the effective strength of the Army as of 1 October 1941 (1 Infantry division almost complete, 5 antiaircraft regiments, 2 bomber squadrons, 3 pursuit groups); as of 1 January 1942 (2 divisions, 1 cavalry regiment, 7 antiaircraft regiments, 3 bomber groups plus a squadron and 4 pursuit groups); and as of 1 April 1942 (3 infantry divisions, 1 armored corps including 1 motorized and 2 armored divisions, 1 cavalry regiment, 9 antiaircraft regiments, 7 bomber groups, 7½ pursuit groups).

### WPD Recommendations

The recommendations this time were more vigorous than in September:

To secure the Western Hemisphere and Atlantic sea lanes, and to aid Latin America.

To render maximum usable aid to Britain, Russia, China, without jeopardizing the arming of American forces.

To negotiate with Japan in order to block her collaboration with the Axis.

To deter her aggressiveness by display of strength in Hawaii and Alaska.

To defend Hawaii and Alaska in strength. To defend the Philippines with an augmented force, but without heavy commitments. Success in a Pacific war would be at a cost incommensurate with other American interests.

To expand merchant shipbuilding.

To exploit the military potential.

To send observer officers to potential theaters of operation.

In circulating this October estimate to the Secretary of War, the Chief of Staff, and others, along with pertinent data based upon the September Victory Program, General Gerow repeated verbatim much of what he had written on 16 July to the Chief of Staff, with regard to the "more or less nebulous national policy" with which WPD still had to work. From the wording of the July letter, he made a significant alteration, with a view to emphasize the existence of a force-in-being. Instead of possible government commitments "with reference to the defeat of the Axis powers," as in July, he now discussed possible commitments "with reference to the employment of armed forces."

By coincidence, on the very day when this secret "October Estimate" of WPD was circulated among War Department officials, isolationists made known their own suspicions of the course of events. They asserted that, contrary to assurances given to Congressional committees during the draft extension hearings, the Army was currently preparing an expeditionary force for duty in Africa. To cope with this rumor, the Chief of Staff issued a corrective statement affirming categorically that

There is no foundation whatsoever for the allegation or rumor that we are preparing troops for a possible expedition to Africa or other critical areas outside this hemisphere.

Three weeks later, without preliminaries, a newspaper printed an article questioning the accuracy of General Marshall's denial, and recording in some detail the Army's formulation of a program for American participation in the war on Germany. The reference was unmistakeably to the highly secret Victory Program and its accompanying strategic estimate, and there was concern in the Department both over public references to that document and over the imputation against General Marshall. Within the Staff, an impersonal statement of information for the press was drafted, declaring that

This [the earlier Marshall] statement was and is correct. It does not preclude the study of possible eventualities, one of the primary duties and responsibilities of the War Department. . . . Failures to make such studies would constitute a serious dereliction on the part of the responsible military authorities. The object of the study referred to by the press was to determine production requirements. . . . We are not preparing troops nor have we asked for funds for an AEF.

### Secretary of War Statement

Instead of having this impersonal statement issued, Secretary of War Stimson elected himself to champion publicly the Department's conduct. He summoned a press conference for 5 December, and without waiting to be questioned, as was his custom, read to his prospective questioners two dramatic inquiries of his own:

What would you think of an American General Staff which in the present condition of the world did not investigate and study every conceivable type of emergency which may confront this country, and every possible method of meeting that emergency? What do you think of the patriotism of a man or a newspaper which would take those confidential studies and make them public to the enemies of this country?

The publications are of unfinished studies of our production requirements for national defense, carried on by the General Staff as a part of their duties in this emergency. They have never constituted an authorized program of the Government.

The gravity of the matter was obvious, although just how vital was military security was less apparent to the layman on 5 December than it was 2 days later. The Army's implementation of the Victory Program as such continued until, on 7 January 1942, under the tremendously increased pressure for swift production following Pearl Harbor, a new sighting of industrial objectives was called for. On that day, the Deputy Chief of Staff announced that "The Victory Program has been replaced by the War Munitions Program."

The basic information in the Victory Program—on the number of men available to the Army—was altered to a surprisingly small extent. The original computations of a few items were so large as to startle the Supply, Priority, and Allocations Board, one of whose members declared (as General Aurand later recalled) that this matériel "could not be produced before the year 2050." He was wrong, and even if the computations then seemed for a time to be setting the sights of industry too high, they most abruptly ended the Nation's unmistakable error of the past in having set industry's sights too low.

### Personnel Planning

In the closing days of the preparation of the Victory Program, which sought an orderly basis for matériel planning, there came a serious jolt to the Army's personnel planning. Ever since 1939, when European orders from American aircraft factories had begun to encroach upon the US Army's inflow of new weapons to meet its own requirements, there had been recurring conflicts of interest. Matériel production was consistently less than demand, and weapons which poured overseas to Great Britain were as unavailing to US Army needs as though they never had come from the factory. The lack of weapons or ammunition not only hampered the equipping of the new Army but delayed the training of the new units, as General Marshall pointed out in 1940 and 1941. It was largely to overcome this disturbing interruption to training that the Deputy Chief of Staff on 3 February 1941 had pressed for a formal restatement of American Defense objectives—an early harbinger of the Victory Program itself.

The summer's events had done much to expedite the deliveries of matériel and the planning of greater deliveries to come. But the training authorities of the Army had likewise pushed the personnel training program with energy. General Marshall had greatly encouraged such a program in the February restatement referred to, in that it projected two augmentations of the Protective Mobilization Plan—the first to a 2,800,000-man Army, the second to 4,100,000. With that encouragement, conditioned though it was, planning of the greatly enlarged Army proceeded. This, and the need for better training of the new troops already on active duty by way of the National Guard and the draft, had induced the decision to extend those troops' duty beyond the period of the year originally specified. The difficult fight in Congress to gain that extension was won only in late summer, 12 August 1941; and as the Victory Program for matériel planning was nearing its completion, the training authorities of the Army were developing their own plans for further inductions and for the building up of new divisions and corps and army troops.

### Proposed Reduction

In late August, the Operations and Training Division of the General Staff was counting upon authorization to summon 462,000 recruits above those already authorized. At this stage, the chief of that Section, reading the Chief of Staff's recent remarks to a Congressional committee, became aware that General Marshall himself was not asking for any such increase, but for only 150,000. It was a chill-

ing reminder that the Chief of Staff had his own doubts about the possibility, or even the wisdom, of pressing forward rapidly with personnel training when there was an uncertainty about the proportionate inflow of equipment for distribution to the Army. Apparently, this was a reflection of reasoning outside the Army. The campaign for giving much more attention to production was having a surprising secondary effect—it was encouraging a view that increased production was more important, for the present anyway, than the balanced program of production paced with training, and training paced with production, upon which so much emphasis had been laid hitherto.

A climax was reached on 20 September when the Chief of Staff summoned representatives of G-1, G-3, and WPD to a morning conference and stated that he was "going to the White House the following Monday to discuss with the President a proposal to reduce the strength of the Army in order to make available more matériel for other purposes." He referred to a widely circulated newspaper article of that day, which had suggested a reduction of the Army on the ground that the trend of war made American participation one "basically of Navy, Air, and manufacturing," with early need for ground forces apparently lightly regarded. The Chief of Staff apparently suspected that this was in line with one of Mr. Roosevelt's own mutually conflicting views, for notes of the conference mention his recognition of difficulty in reconciling a reduction of troops with other of the President's indicated desires for "the possible occupation of bases in the Atlantic, including Dakar, Cape Verde Islands, Azores, Natal, and possibly the establishment of base service units in the Middle East." Inconsistent or no, General Marshall was desirous of information to be used at the coming meeting at the White House.

The agenda for Mr. Roosevelt's coming conference must already have been made clear to him, for the notes of General Marshall's remarks to his aides proceed:

> The proposals which have been made are as follows: (1) to reduce the size of the Army; (2) to reduce the amount of matériel being used by the Army; (3) to reduce the strength of our forces in the bases. . . . The Chief of Staff also pointed out that steps are being taken to reduce the garrisons in Hawaii and Panama; that the situation in the Philippines might be decisive within the next 2 months [Japan's attack actually came in less than 2½ months]; and that our present augmentations there are of outstanding importance.

### WPD Study of Reduction

The Chief of Staff's directive to his Staff advisors was that WPD take the lead in preparing a study on two lines; (1) a defensive against a decrease and (2) a discussion favoring actual increases in the Army for an all-out effort. This final item of the directive suggests that the Chief of Staff at that time was preparing to oppose the Presidential desire for a reduction of the forces, not merely because it was strangely inconsistent with his own recent pleading to Congress—successful only after so great a struggle and by so narrow a margin—for extension of the selectees' training period, but also because in truth there was obvious need for building up the forces of which so much was expected.

Over the week end, both WPD and the office of the Secretary labored on data to support the Chief of Staff's argument against a reduction of the Army. The fruit of their labors, plus several relevant exhibits, General Marshall carried with him to the White House as aids to his oral discussion. In the packet were an unsigned and undated memorandum labeled "Morale of the Country" and penciled "Reply of McCloy and Lovett"; an undated memorandum for the President which WPD had drafted and which recited the personnel plans for the various bases and task forces; a memorandum dated only "September 1941" from General Gerow on Ul-

timate Tonnage Requirements (differing sharply with the Navy's desire to restrict the Army's overseas force to 1,500,000 men); another of 16 September on the availability of Army forces for taking Dakar (recommending against action, by reason of weak forces and bad weather, prior to November 1942); a memorandum from W.B.S. [Colonel Smith] 16 September to the Secretary reporting 1,200 men in Trinidad ready to protect bauxite in Dutch Guiana; a signed letter of 12 September 1941 to Admiral Stark from General Marshall, recounting what was being done to strengthen the Philippines; a memorandum of 19 September from Colonel [later Major General] R. W. Crawford, acting WPD chief, recounting (1) a conference of WPD officials with the Secretary of War on the necessity of protecting Natal and Peru and (2) the impossibility of taking and holding the Cape Verde or Canary Islands or a foothold in West Africa (the memorandum favored aid to Britain and China but questioned whether aid available to Russia would have a material effect); data on the effect of reducing the garrisons; finally, Staff recommendations on priorities in army reduction if, after all, that should be necessary.

The support of Assistant Secretaries McCloy and Lovett was spirited. It argued that "to shift our national objectives by reduction of our Army at present would be disastrous," noting from the military viewpoint that Russian armies might be on the verge of disintegration, that Japan and Turkey were on the brink of entering the war, and that Germany was on the point of a Middle East offensive. Politically, the Assistant Secretaries argued, American statement of effort would "encourage collaboration with the Axis throughout Europe and permanently stifle the spirit of resistance to the Axis," and "abandonment of maximum effort in any form would be considered a step toward appeasement, for a negotiated peace is at the root of the (Walter) Lippmann article—not a complete victory." Morally, they added, such a step "will inevitably be construed as an attempt to limit our commitment." Militarily, they urged the need of a large modern army to do what Britain and Russia could not do alone, and to do the things for which sea and air forces were not competent; "to write off the possibility of American manpower is probably to write off the decisive factor in victory."

### Need for Ground Forces

The WPD memorandum pressed this argument that Germany could not be defeated by supplying munitions to friendly forces or by air and naval operations without a large ground force participation. It presented the immediate requirements of the Western Hemisphere (minimum garrisons and task forces for use against the Atlantic islands and Natal), the Western Pacific (build-up of air power for the Philippines plus small increases of ground elements), and the European theater (security forces for air and naval bases in the British Isles and task forces for additional bases encircling Germany). It recited the authorizations for garrisons as follows:

> Atlantic bases—Greenland, 2,500 men (few yet there), Newfoundland, 5,500 (2,500 there), Bermuda, 4,000 (800 there), Jamaica, 876 (14 there), Trinidad, 16,000 (1,800 there); and Puerto Rico, 21,000, British Guiana, Antigua, Santa Lucia 350, Panama, 33,000 (all there).
>
> Pacific bases—Alaska, 24,000 (16,000 there), Hawaii, 41,000, Philippine Islands, 31,000 (12,000 more needed and about half of equipment still lacking).
>
> Task forces—East Coast Task Force, 27,000 men (reserve equipment lacking); West Coast Task Force, 27,000 (same); Relief forces for Azores after capture by landing force, 27,000 (same); Expeditionary corps for possible use in Brazil or other theaters, and as reinforcements, 154,000; Iceland Force, 28,000 (5,000 now there).
>
> Remainder of Army—GHQ Reserve of 4 armored and 2 cavalry divisions plus antiaircraft troops, 115,000; two field armies of 20 divisions, 465,000; Air Forces, about one-fourth combat troops, 250,000; harbor defense troops, 45,000; administration, 125,000; trainees not assigned, 150,000.

The memorandum stressed that the task forces and overseas forces needed 100 percent of their equipment, and that the "remainder of the Army" forces could not be cut below 50 percent without seriously lowering morale and retarding development of the new units. A WPD suspicion that the continued British pressure was responsible for Mr. Roosevelt's change of mind is suggested in the remark that "no appreciable increase in defense aid desired by the British can be realized except by eliminating units of the remainder of the Army," and the memorandum proceeds:

> To shift our national objectives by the reduction of our army at the present time might well be disastrous. Certainly, the momentary encouragement it would give the Russian and British governments would be far outweighted by the positive indications it would give to the German government that they need not fear an eventual onslaught of ground forces.

### Tentative Reduction Plans

Despite the week-end labors of Staff and Secretary's office and the accumulation of these data and arguments, General Marshall failed to dissuade Mr. Roosevelt. On 3 October, the Deputy Chief of Staff's conference was still discussing augmentation of the Army, but the die was cast, and on 7 October General McNair proposed a plan for making the best of a difficult situation. The GHQ Chief of Staff came that day to General Marshall's office with a suggestion for placing the "best" National Guard divisions on an inactive status and organizing new divisions in their place. This, General McNair explained, would avoid an actual net increase in the number of men in federalized service and thereby, possibly, meet the President's wishes. It would transfer the trained division in question to the reserve, more or less ready for reactivation in emergency. It would start the training of an entirely new division. General Marshall at first opposed the suggestion, pointing out that in retiring the best of the National Guard divisions there would necessarily be an increase in the proportion of poor ones. Also, he still felt it "would seem inconsistent in view of our recent efforts to obtain legislation for retention of the National Guard in service. . . . It could be expected that upon inactivation a National Guard division would disintegrate, due to its men moving to other states and obtaining defense jobs."

During the week, however, the Chief of Staff became convinced that this was the best he could get out of a depressing situation, and he summoned a conference with representatives of WPD, G-1, and G-3, to consider a plan for sending home the National Guard divisions in the order of their summons to federal service. This approximated the McNair suggestion for the "best" divisions but avoided invidious public distinction as to their quality and unnecessary public disputes over priority of release. The plan contemplated that when a National Guard Division was thus sent home that part of the division's personnel which had been lately added to its ranks, and hence was not ready for discharge, would remain in camp as part of a new Regular Army division being created —a "triangular" division from the outset, thus hastening the upbuilding of the whole new Army on that basis. The following day, at a larger conference attended also by the Deputy Chief of Staff and a GHQ representative, this suggestion was approved with some modifications, and a few days later G-3 was directed to work up a final plan to that result. This was finished in 10 days, and on 31 October a G-3 spokesman presented a chart showing the prospective course of deactivation of the National Guard's 18 infantry divisions on a progressive basis, beginning in February 1942. The plan provided for the current replacement of each with a new Regular division, save at four camps which would become new replacement training centers.

Thus, beyond the old Regular divisions, there would at all times be 14 new divisions at a fair stage of training. As the National Guardsmen went home, the relatively new trainees who had been with them would remain as individuals for completion of their training. That completed, it was proposed by the Chief of Staff that they too go home, to be enrolled in local reserve divisions, by a technique yet to be worked out.

This was the prospective solution for a difficult problem in training, brought on by the training program's conflict with the matériel program. It remained only prospective. Long before February 1942 came, the Japanese attack at Pearl Harbor had ended all thought of Army reduction.

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**Our resources must be divided to provide the best possible defense and offense. It is understandable that all the services, having a justifiable pride in their accomplishments and traditions, and all of whom have brought imperishable glory to American arms, feel the effects of unification. With unification there must be a curtailment of expenditures and great difference of opinion, but the Secretary of Defense must decide that difference.**

*Bernard M. Baruch*

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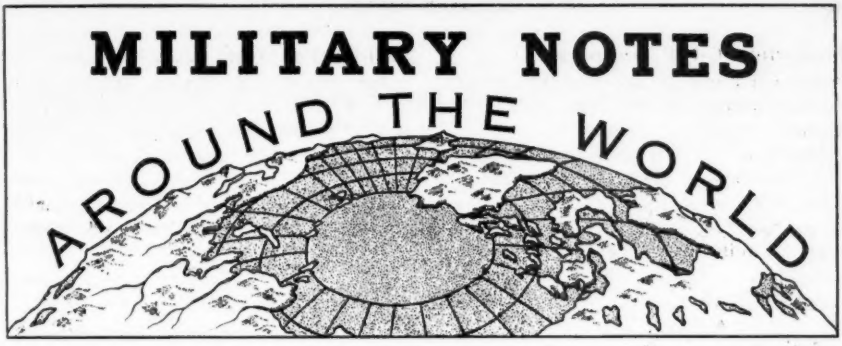
**To conduct a modern war, a nation must have a program not only for raising, organizing, and training its manpower, but also a program for providing it with the most modern equipment, and in sufficient supply.**

*General J. Lawton Collins*

# MILITARY NOTES AROUND THE WORLD



## UNITED STATES

### *Land Transport*

The Army has been assigned the responsibility for the operation of common-use military land transportation, including highway, railroad, pipe line, and inland waterway.

This assignment was recommended by the Joint Chiefs of Staff upon the completion of a study requested by the Secretary of Defense. It follows the recent assignment of responsibility for all sea transport to the Navy.

Pending further study, each Department will continue to make its own arrangements with commercial carriers in the United States for its transportation requirements. The Army will make plans and provide personnel and equipment for the operation of land transportation in overseas areas which are occupied by two or more of the services.

Details of the consolidation of responsibility for land transport under the Army are being developed by the Joint Military Transportation Committee of the Joint Chiefs of Staff. This Committee is being given additional duties, including the establishment of policies, procedures, and guidance for the allocation of available space; issuance of movement directives; and establishment of priorities.—Department of Defense.

### *Range Finder Tested*

A special set-up for the study of range-finder performance under various climatic conditions has been established at the National Bureau of Standards, with the cooperation of the Army Ordnance Department. This laboratory is the only one of its kind in the United States, and so far as is known, the most complete in the world.

The laboratory is equipped for the complete analysis of range-finder behavior under controlled conditions corresponding to a wide range of climate.

Optical range finders which this laboratory will test are used by the armed forces to measure the distance from an observer to a target. They are among the most intricate and costly optical instruments yet developed.

For satisfactory measurement of range at usual target distances, the error in determination of the very small angle between the rays from the target must be exceedingly small. The rough treatment received in wartime transport, the large size of the instrument, and other factors, make attainment of this accuracy difficult. The range finder must, therefore, be so designed that the instrument errors are eliminated or compensated. — *Science News Letter.*

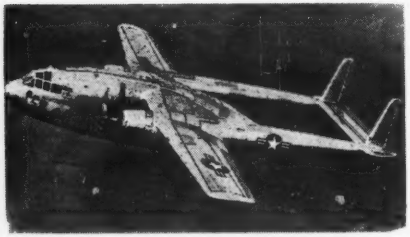
### *Production C-119 Accepted*

The Air Force has accepted the first production model of the Fairchild *C-119 Packet.*

Latest of the "flying boxcar" line, the *C-119* production models will succeed 220 *C-82* airplanes which have been delivered to the Air Force. Early deliveries will be made to units under the Continental Air Command.

A total of 144 *C-119s* will be built under the existing contract.

Designed as a troop and cargo carrier, the *C-119* is ideally suited to its role in the "air-transportable Army." Capable of



**Production version of the *C-119.***

carrying a pay-load of 36,309 pounds, the *C-119* may be equipped as a troop transport, litter carrier, or heavy cargo aircraft.—Fairchild Aircraft Corp.

### *Airborne Training*

General J. Lawton Collins, Army Chief of Staff, disclosed recently that the Army and Air Force were stepping up the training of crack airborne troops—the type of soldiers who would play a major role in any future war.

In addition, training in use of fighter-bombers—the "artillery" of airborne operations which supports swift advances of infantry and armored divisions—is being intensified.

The general said both training plans had an overriding priority over amphibious operations which were the key strategem in World War II.—*The New York Times.*

### *Seat-Ejection Tests*

Air Force seat-ejection, bail-out tests have recently resulted in successful ejection of personnel from a jet plane flying at more than 550 miles an hour.

The tests were carried out by test crews of the Air Force's Air Matériel Command, and the actual bail-outs were made by two AMC volunteers.

The tests were made at various speeds. One man was shot clear of the plane at air speeds of 530 and 555 miles an hour during the latter stages of the tests. Another completed a seat-ejection bail-out at an air speed of 405 miles per hour, earlier in the test program.

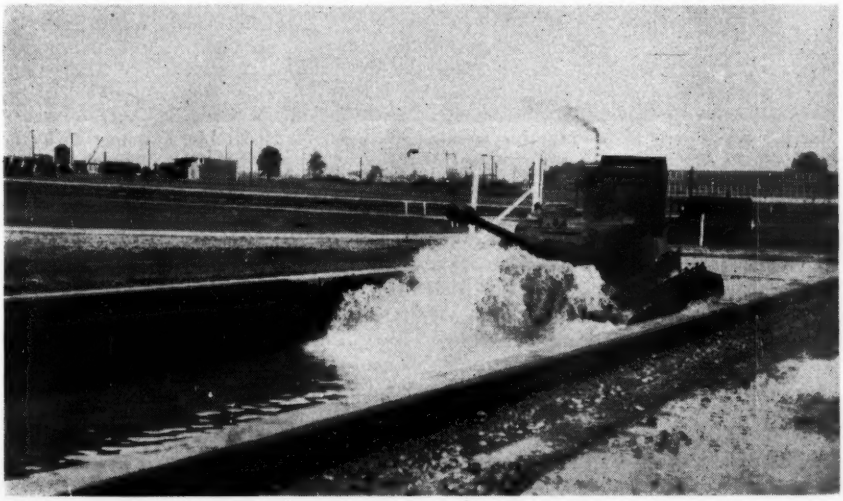
Emphasizing that the standard ejection seat will be a reliable and safe method for emergency escape from disabled aircraft, one of the men testing the equipment pointed out that he felt no ill effects from the sudden acceleration at the instant of the seat's ejection from the plane, from the wind blasts striking him as he shot clear of the plane, or from any other forces. He stated that an escaping pilot would easily be able to actuate the manual controls to free himself from the seat and open his chute in case of failure of the automatic control.

The device actually fires the pilot out of the aircraft while he is still strapped to the cockpit seat. The seat is mounted on a tube which extends down its back. This tube fits inside the barrel of the firing mechanism. The pilot is shot from the aircraft as a 37-mm cartridge at the base of the tube is exploded.

After being ejected, the seat is stabilized by automatically operated flaps and a small drag parachute. This drag chute also rips open the pilot's safety belt and opens a seat retarder chute which keeps the seat from becoming entangled with the parachute worn by the falling pilot. The pilot's chute is then opened by a static line attached to the seat.—Department of Defense.

## *Ordnance Developments*

Many types of new Ordnance matériel are being developed and tested at Aberdeen Proving Grounds, Maryland. Above, an assortment of heavy and light carriers, self-propelled artillery weapons, a 100-ton heavy tank at the right, and an 8-inch gun with carrier. Below, an M-26 "Patton" medium tank going through the water bath in a test of fording devices.—Department of Defense photos.



### *Portable Photo Lab*

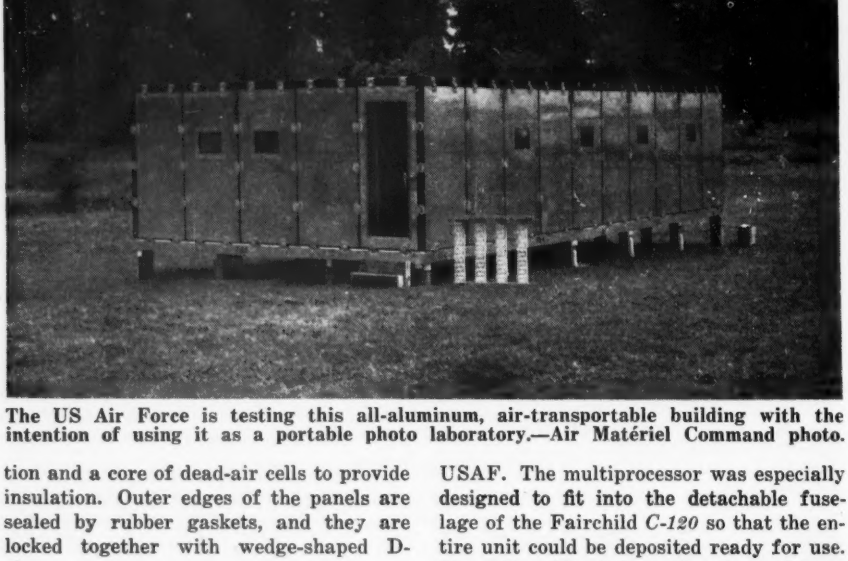
An aerial photographic laboratory, designed to be moved wherever needed, is now being evaluated by officials of Air Matériel Command's Photographic Laboratory to determine its suitability for forward-area use during any future emergency.

Basis of the packaged unit is a prefabricated shelter measuring 20 x 40 x 8 feet which provides 800 square feet of floor space. Its 87 x 4 x 8-foot panels are made of two sheets of .04-inch aluminum with a sandwich layer of honeycomb construction and a core of dead-air cells to provide insulation. Outer edges of the panels are sealed by rubber gaskets, and they are locked together with wedge-shaped D-rings.

Fourteen 20-foot aluminum beams make up the floor and ceiling, and each beam can be handled by two men. Twelve sidewall panels are fitted with 2 x 2-foot windows made of plexiglass with air space between. At one end of the building is a door with an air lock, and at the other is an emergency escape hatch. The floor will withstand a load of 250 pounds per square foot.

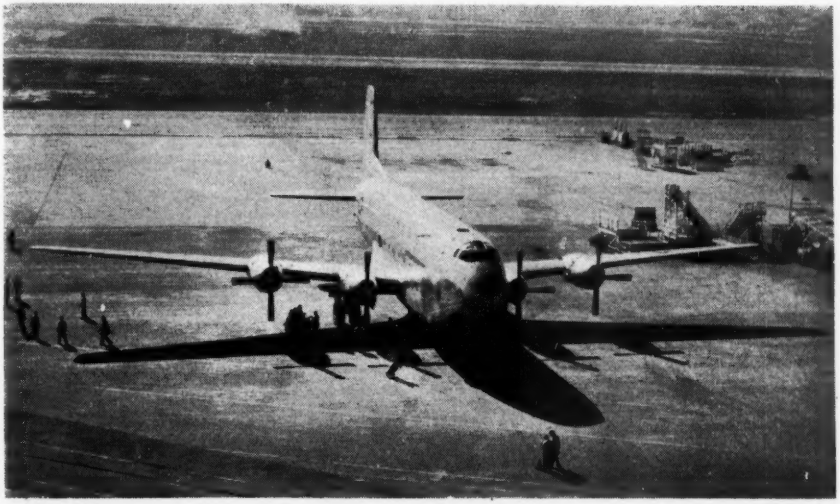
The building must be set on blocks high enough off the ground so that workmen can crawl under the floor to fasten the D-rings which hold the floor together. The elevation also provides an air-circulating space to keep moisture out.

The shelter is expected to be used in conjunction with a new portable photo-multiprocessor recently announced by the USAF. The multiprocessor was especially designed to fit into the detachable fuselage of the Fairchild *C-120* so that the entire unit could be deposited ready for use. The collapsible shelter, plus the multiprocessor and the necessary photographic supplies, could be transported into a forward area by a cargo plane such as the Fairchild *C-119*. The 9,253 pounds of the shelter, and the slightly less than 3,000 pounds of the multiprocessor, would fit well within the maximum payload limit of the *C-119*. —Air Matériel Command.

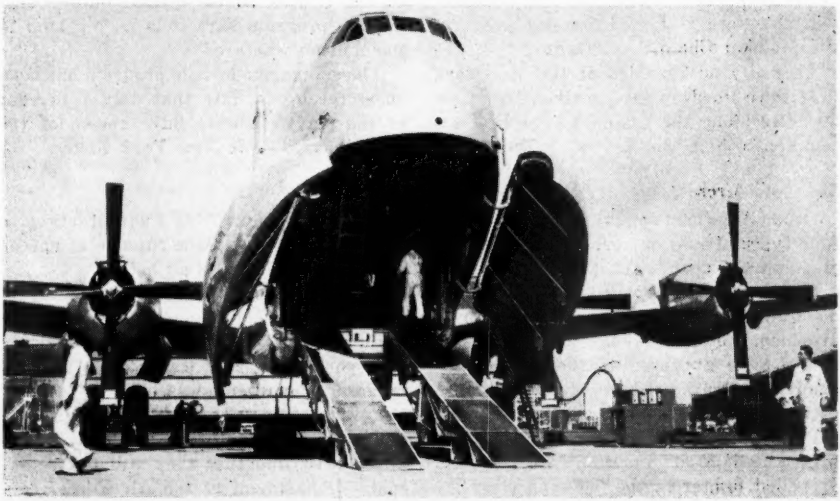


**The US Air Force is testing this all-aluminum, air-transportable building with the intention of using it as a portable photo laboratory.—Air Matériel Command photo.**

### *Largest Production Transport*



The US Air Force's Douglas *C-124* transport shown above is the largest of this type actually in production. The plane can carry 50,000 pounds of cargo. Below, the clam-shell doors and integral ramp which permit wheeled vehicles to drive or be rolled aboard. Heavy equipment, such as tanks, field guns, bulldozers, and loaded trucks can be carried in the 77-foot long cargo hold.—Department of Defense photos.



### Subs Fire Guided Missiles

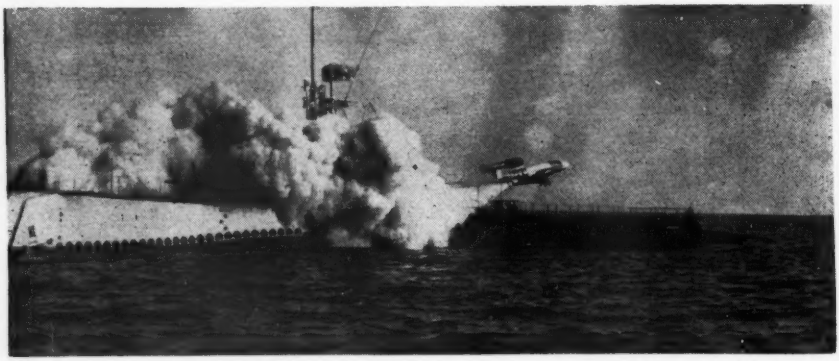
Two specially converted Pacific Fleet submarines fired guided missiles in Hawaiian waters recently while the Navy's First Task Fleet, assembled for exercise *Miki*, attempted to bring them down.

The missiles used in the maneuver were 15,000-pound "Loons," which were fired from launching platforms of the submarines *Cusk* and *Carbonero*. The two submarines were stationed 2 miles apart in the Molokai Channel off Oahu.

As many as 70 ships of the *Miki* task fleet were lined up in a northeast line for 50 miles along the Channel. The fleet attempted to halt the "Loons" with antiaircraft fire and then a number of carrier planes tried to shoot them down as they traveled at an estimated 500 miles an hour at a 2-mile height.

This was the first test of its kind with guided missiles shot from submarines. The Navy has been experimenting with such weapons for some time. The junior chief of the United States guided missile submarine program says it is a "big step in pushbutton warfare."

The submarine missile program has been so secret up to date that only 1 percent of the Navy's officers have known of the experiments.—*The New York Times.*



**The "Loon," a missile of the V-1 type, is shown being launched from a submarine. It was used as a target for an antiaircraft exercise.—Department of Defense photo.**

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### Sale of Aircraft

Other American republics may purchase four types of new or surplus military aircraft on the open market under terms of an agreement between the State Department and the Department of the Air Force, provided, however, that such purchases will not be approved if they would endanger the national security or interfere with Air Force procurement.

Planes approved for purchase:

Lockheed *F-80 Shooting Star*, a jet-propelled fighter in the 600-mph class.

North American *F-82 Twin Mustang*, a two-engine fighter plane capable of speeds in excess of 475 miles an hour.

Republic *F-84 Thunderjet*, another jet fighter in the 600-mile-an-hour class.

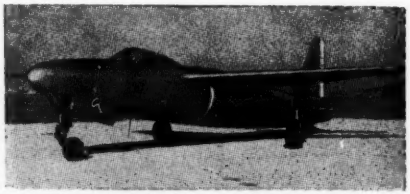
Fairchild *C-82 Packet*, a two-engine transport capable of carrying 9 tons of cargo or 48 paratroopers.

Purchasers must agree that the aircraft will be used for military purposes by the purchasers, and that they will not be resold.—Department of the Air Force.

## FRANCE

### *Latest Jet*

The French Arsenal *VG-90* carrier-borne jet fighter has now been completed. Similar in general layout to the *VG-70*, it differs by having a Hispano-Nene engine, side air intakes, and a shorter undercarriage. Estimated maximum speed is 562 mph.—*The Aeroplane*, Great Britain.



**Arsenal *VG-90* carrier-borne jet.**

## AUSTRALIA

### *History of World War II*

Seven writers are working full-time and six part-time on Australia's biggest literary project—a 22-volume history of Australia's part in World War II. The General Editor, Gavin Long, expects the work to be finished in 1953, except for one volume due in 1954. About one-third of the work is already finished, although only one complete volume is ready for the press. The 12-volume history of Australia's part in World War I took 23 years to complete.

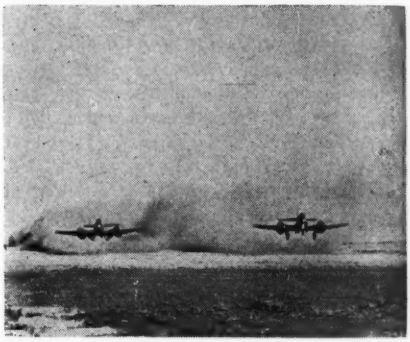
The editor's officially-backed plan is to produce an unbiased, uncensored, factual story of what actually happened as near as it is humanly possible to find out. The history is intended to record the triumphs and failures of the men who fought and of the men who planned.

Of the 22 volumes, one will be devoted to General Defense Policy, six to the Army, two to the Navy, three to the Air Force, four to the home front, four to medicine, and one to photographs. The final volume will be a summary prepared for separate sale in popular form.—*Army and Navy Journal.*

## ARGENTINA

### *Jet Firing Test*

The Argentine Air Force recently conducted its first firing practice with newly-acquired jet aircraft, Gloster *Meteors*, purchased from Great Britain. This was the first time jet planes were used by any South American nation in actual firing problems. Altogether, 25 aircraft took part in the exercises, which included the firing of cannon at both stationary and mobile targets. Of special note was the small dispersion ratio of the cannon fire as compared to regular rapid-fire weapons.—*Aero Mundial Suplemento Argentino.*



**First jet firing test in South America. Above, a *Meteor* shooting over the target; below, a two-plane attack. Both moving and stationary targets were used.**

## GREAT BRITAIN

### *Revolutionary Warships*

The prediction that in the next few years there are likely to be "several categories of warships of revolutionary type" was made in the 1949-1950 edition of *Jane's Fighting Ships*, British naval annual.

While the world powers have adopted a postwar naval policy of "make-do-and-mend," the foreward to the new volume said, "there are signs that new fleets are in the making."

In the next few years, the foreword added, the world is likely to see such vessels as an atomic bomb carrier task force, an anti-submarine cruiser, rocket destroyers, fast, low-lying frigates, and gas turbine ships.

Already, according to data assembled by *Jane's*, naval powers are experimenting with such revolutionary vessels, particularly the United States.

The volume noted that a long-range plane capable of carrying atomic bombs had taken off from the United States aircraft carrier *Coral Sea*, that the United States Chief of Naval Operations had predicted that guided missiles would become a basic naval weapon of the future, that some United States submarines were being converted for guided-missile operations, and that the seaplane tender *Norton Sound* had been converted and is being used as a seagoing rocket laboratory ship. (MILITARY REVIEW, March 1949, p. 67.)

Noting the cutback in British naval construction, particularly of aircraft carriers, *Jane's* suggested that the Admiralty might be awaiting the results of experiments with existing carriers. The book reported that the light carrier *Warrior* had completed trials with a flexible landing deck for jet fighters equipped with skids, that two fleet destroyers were being converted to prototype fast frigates, and that the only two major warships ordered by the Admiralty since the end of the War were two fast anti-submarine frigates of a novel type.

The preoccupation with defense against submarines, as evidenced in the pages of *Jane's*, seemed to reflect concern over the size of the Soviet Union's submarine fleet. *Jane's* said there was no lack of reports about the Soviet Navy, but many reports could not be reconciled and some could scarcely be credited.

"It is reported (and presented here with all due reserve)," *Jane's* said, "that in the course of the new 5-year plan for the Russian Navy (1945-1950), feverish activity has been going on in all Russian shipyards as well as the Russian zone of Germany." These include Schichau at Danzig and Koenigsberg, and Vulcan at Stettin—now all Russian or Polish—and Neptun at Rostock, where possible patrol boats and minesweepers are now being built day and night. Work is on a three-shift basis.

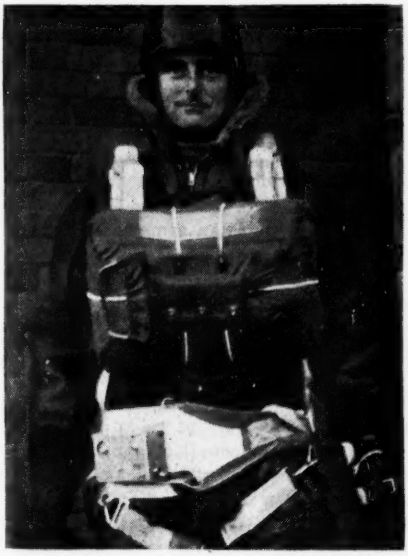
Two conflicting reports on the size of the Soviet submarine building program are quoted by *Jane's*. One said the program was for 750 submarines by the end of 1951; the other put the figure at 1,000. *Jane's* expressed doubt that such a program could be fulfilled.

Mentioning the report that the Soviet Union was building submarines with great range and high-submerged speed, *Jane's* also reported that such experimental craft as the *Meteorite* were built by the Germans and were now in Britain's hands and that the United States was building four to be powered by hydrogen peroxide.

In several passages, *Jane's* cautioned against ready acceptance of reports about the Soviet Union.—*The New York Times.*

### *Automatic Parachute*

The new parachute successfully demonstrated recently in Britain will give greater protection for flyers at the great speeds and high altitudes now reached by jet aircraft. A former Army parachutist made a trail jump from a *Dakota* flying at 15,000 ft. He held a stop watch to check the speed of his descent. The new parachute is operated by a barometric release device fixed on the wide belt on the jumper's right-hand side. It enables the airman to pre-set his parachute to open at a predetermined altitude. In addition, the mechanism contains a small clock which comes into action if the wearer jumps below the height at which the release is set. This additional device delays the pulling of the ripcord, which is operated by a compressed coil spring, until the airman has fallen clear of the aircraft. By this method, injured airmen can be safely lowered.—*The Sphere*, Great Britain.



**Device that opens chute automatically.**

### *Frogman School*

Regulars of the Royal Marines who have undergone all other types of training, including service afloat, now attend the Royal Marine Amphibious School. There they undergo training as frogmen. The Small Raids Wing of the School trains men for carrying out night raids on enemy-held coastlines from collapsible canoes. One of the other sections of the School is the Landing Craft Obstruction Unit. This unit is responsible for clearing beach obstacles before a landing.—*The Sphere*, Great Britain.

**Above, a frogman prepares for his attack; he leaves a canoe equipped with a mine. Below, the equipment used includes rubber suits, fins, and breathing apparatus.**

## USSR

### *'Atomic Cloud'*

The International Committee for the Study of European Questions said recently in London that it had evidence that the Soviet Union was trying to produce "atomic clouds" for use against enemy troops.

The committee submitted its report to the Premiers and Foreign Ministers of the Western democracies.

"According to information received, the USSR is not only interested in the production of the atomic bomb, but is also interested in research leading to the use of atomic weapons under the form of atomic clouds," the report said.

"This information indicated that the USSR is contemplating the use of atomic weapons not only for the destruction of industrial centers and ports, but also against troops in the field, a purpose for which the atomic bomb cannot be effectively used."

The committee said Soviet scientific journals indicated that "it is technically possible to produce atomic clouds by allowing different kinds of gas to pass through atomic piles and by concentrating them afterward by pressure."

"Production of such clouds," the report added, "does not give rise to explosions and we would therefore not be aware of their production, which could not be registered by our seismographs as in the case of the atomic explosion which occurred in the USSR."—*The New York Times.*

## SWEDEN

### *Air Strength*

Sweden's front-line air strength will consist principally of 500 recently-ordered *Saab J-29* single-seat jets and 210 *DeHavilland Vampires,* plus a wing of *Mosquito* night fighters. It is believed the *J-29's* top speed will be "in excess of 620 mph."—*Flying.*

## CZECHOSLOVAKIA

### *Uranium Mine*

Czechoslovakia is supplying Russia with large quantities of uranium ore from a new mine near Prague, a diplomatic source in Washington disclosed recently.

Figures on the amount of ore being dug could not be determined, but it was thought that this vital source of atomic energy might well be the communist-dominated country's principal export to the Soviet Union.

Presumably, all the uranium being mined is going to Russia, in its raw state, for stockpiling. The mining, it was said, is being done under the supervision of Russians or Czech communists, with German slave labor being used for the work.

Russia, officials said, is prodding Czech leaders to develop the country into an "industrial arsenal" that could serve all of Eastern Europe as an armament producer in the event of war.

New factory sites are being selected and developed in eastern Czechoslovakia, and it is generally understood that the plants being erected there could be converted to war production if the need arose.

But Russia, while taking nearly half of Czechoslovakia's present industrial output, is getting no important armaments there. Some light tanks, small arms, and ammunition are known to be going to other countries.

An informed source said that while Czechoslovak industry was in "fair health," a number of difficulties stood in the way of its expansion to the degree desired by Moscow. Production was estimated at 50 to 75 percent of its wartime peak.

Industry there was lagging partly, it was said, because most of the German Sudetens with industrial "know-how" had been taken out of the country. Also, the Czechs no longer had dollars with which to buy the high-grade steel they used to import from Sweden.—*The New York Times.*

# The Future of Naval Air

**Translated and digested by the MILITARY REVIEW from an article by Captain Lepotier, French Navy, in "La Revue Maritime" (France) August 1949.**

SINCE World War II, military writers have vied with one another in acclaiming the decisive role of the aircraft carrier in naval warfare. They have regarded it as a principal instrument in control of the seas and as a revolutionary weapon which has made it possible for naval forces to operate deeply in enemy territory for the first time in history. The true capital ship of the war in the Pacific was the aircraft carrier, which made all the great offensives possible. It proved much less vulnerable than might have been expected, when suitably protected. It was even able to resist the furious attacks of the Japanese *kamikaze* planes.

It is indeed odd to see a campaign now suddenly being revived which casts doubt on the dominant role of air-naval forces in the near future, on grounds which were advanced even before 1939.

Colonel Mansuy says: "The steadily increasing radius of action of aircraft increases more and more the possibilities of land-based aviation. Bodies of water like the Mediterranean can be dominated by the power which possesses a few judiciously placed land bases on its shores. Tomorrow, the oceans will be only large lakes to aircraft or flying missiles traveling at supersonic speeds."

General L. M. Chassin adds: "The aircraft carrier will never be more than a complementary weapon and will disappear as soon as land-based planes possess sufficient radius of action."

### Theory vs. Practice

A few remarks are in order at this point as to the concept of "radius of action." The theoretical and the practical must not be confused. The theoretical radius of action is the distance that can be covered in a straight line by total consumption of the fuel carried and at a regular, pre-selected speed. The practical radius of action for a military operation takes into account the combat load, the numerous detours and changes of speed imposed by the mission, and the necessity for holding back a margin of safety in case of a sudden encounter with the enemy before the home base has again been reached.

French sailors will recall, for example, that 1,650-ton torpedo boats had great difficulty in escorting slow convoys from Casablanca to Brest, 970 miles in a direct line, when bad weather lengthened the time of the voyage. When it is necessary to return after operations to the initial point of departure, the operating radius of action is considerably less than half of the

theoretical radius of action. At most, it is about three-eighths of the theoretical radius of action for aircraft, without considering the additional hazards of mechanical failures or damage by combat or bad weather.

The second point is that technical aviation progress has just dealt a serious blow to radius of action, particularly that of combat aircraft. There is a chance that the advent of jet-operated aircraft may, paradoxically, prolong the life span of the aircraft carrier. Fuel consumption in this type of aircraft is such that the distance that can be covered, for example, by the Northrop flying wing drops to 935 miles as soon as it is equipped with jet engines.

This sudden downward dip in the curve of increasing radii of action of combat aircraft will justify the existence of the carrier for many years to come. But there are other reasons why land-based planes or projectiles can never completely supplant heavy aircraft carriers or rocket-launching vessels.

All combat devices are a compromise between speed, radius of action, maneuverability, power, numbers, and endurance. Radius of action is more costly in the case of the airplane than in other weapons, because of weight limitations. In spite of the latest technical developments, distance still remains a formidable problem for the airplane. On the one hand, long distances require enormous loads of fuel, which correspondingly reduce the amount of useful loads that can be carried. On the other hand, distance gives the enemy time to prepare diversionary measures.

The enormous loads of fuel required for large radii of action, at least until the revolutionary change which could come in the future by the use of nuclear energy, exert a decisive influence on the characteristics of the plane, particularly, on its weight. This reduces its maneuverability and limits its capabilities in high altitude bombing, the accuracy of which has always been lamentable when employed against moving vessels on the high seas.

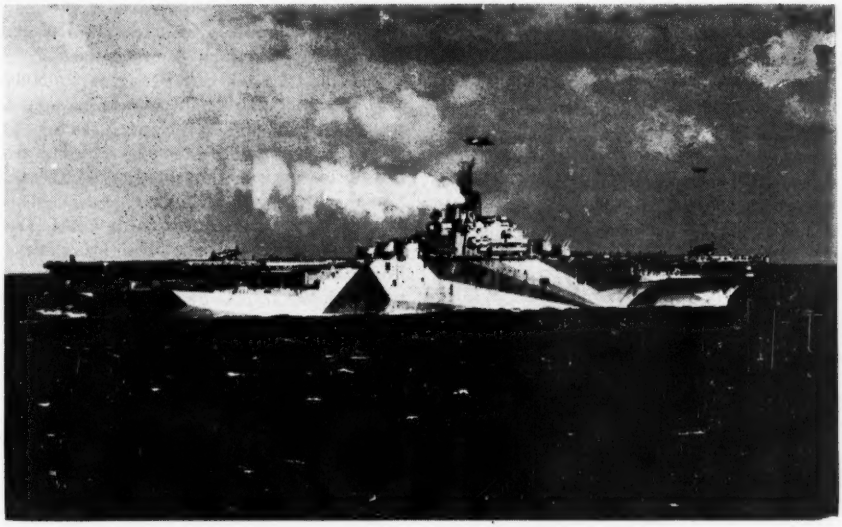
It is admitted today that strategic bombers, which can no longer be escorted owing to the reduced radius of action of jet aircraft, are forced to seek protection against detection, interceptor planes, and antiaircraft artillery by flying at high altitudes—up to 40,000 feet. These cannot locate vessels on the high seas at such altitudes or hit them with bombs.

The problem is different for large geographic targets such as naval bases. But from the point of view of methods of attack, a strategic bomber coming from the land cannot by any means expect to achieve the results that may be attained by torpedo planes, remote-controlled missiles, dive-bombers, or rocket-firing planes launched from an airplane carrier a short distance from the target.

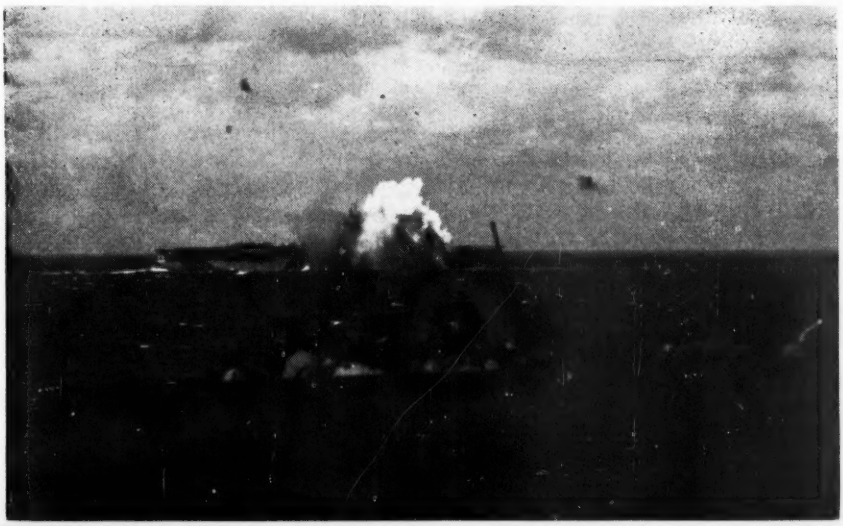
The disadvantage of the long-range plane in air-naval combat is only one of the reasons that will always stand in the way of its employment on the open seas. The most decisive factors are the inescapable delays in intercepting naval forces and inter-service coordination.

### Air-Naval Cooperation

Modern three-dimensional naval warfare requires constant air-naval cooperation in reconnaissance; the protection of surface vessels against the approach of hostile aviation and surface or submarine forces; or attacking or countering some one of these forms of attack. World War II showed that land-based aircraft could not be counted on to effectively fulfill all these missions. As regards the security patrols used in the Spanish Civil War of 1938, M. Rougeron has written: "The airplane which attacks a merchant vessel will have regained its base before the patrol boats, hastening to the assistance of the vessel, will have arrived. Even if naval patrols were replaced by air patrols, it



**"The true capital ship of the war in the Pacific was the aircraft carrier, which made all the great offensives possible. It proved to be much less vulnerable than might have been expected." Above, the *USS Ticonderoga, Essex*-class carrier, recovering planes after a strike; below, "near-miss" by a Jap suicide plane.—US Navy photos.**



would be just as uncertain that the assailant would be intercepted."

Throughout World War II, the inefficiency of land-based aviation in supporting naval operations was evident. First, there was the Norwegian campaign where the undeniable cause of the failure of the Allied reaction was the absence of massed, carrier-based support, especially after the Germans had seized possession of the few Norwegian airfields.

At that time, the British Navy possessed only a small number of carriers. One, the *Courageous*, had been sunk by submarines on 17 September 1939. The planes with which they were equipped had not been designed for combat and still less for operations against land areas. Lastly, their antiaircraft artillery, like that of all vessels at the beginning of the War, was utterly inadequate for stopping *Stuka* attacks. It can easily be understood why, under these circumstances, the British Admiralty refrained from all-out employment of their carriers along the coasts of Southern Norway and in the Skagerrak. These were the very places where, as was later shown by the operations in the Pacific, the massed action of a fleet of carriers of the type employed in the Battle of the Philippines, would have nipped the German maneuver in the bud. Even the timid employment of the carriers *Ark Royal* and *Glorious* in support of the Narvik operation disturbed the Germans greatly. But the *Glorious*, caught in a snow storm, was sunk by the *Gneisenau* and *Scharnhorst*. This proves, in passing, how short-sighted it is to neglect the creation of balanced task forces capable of handling any possible form of attack.

In the final analysis, it was the absence of effective shipborne aviation that doomed the British Namsos expedition to the massed attack of German *Stukas*.

Even though one may recognize the fact that a fleet of carriers would unquestionably have reversed the Norwegian situation, it will be said—at least on the German side—that the *Luftwaffe* showed that it was able to attack enemy vessels from the land. It is not our intention to insist that a land plane would always be unable to score a hit on a ship. Experience proves, however, that it will not be able to act in close tactical coordination with the friendly naval forces and that, consequently, its intervention will most frequently be too late or at the wrong time. For example, 2 months before the Norway invasion, the *Luftwaffe* had sunk two large recently constructed German destroyers, the *Leberecht Maas* and the *Max Schultz*. During the Norwegian expedition, the *Luftwaffe* provided no tactical support to the German naval forces, either on the open seas or during the two naval battles at Narvik which resulted in the total destruction of the ships of the German Expeditionary Forces.

Likewise, at the time of the first encounter of the Italian and British fleets, in July 1940, the Italian Air Force, after having missed the British vessels with 400 bombs, attacked the retreating Italian fleet by mistake: The failures of the operations of the Axis fleets on the high seas were correctly laid to the absence of air-naval cooperation. The most serious of these defeats, the end of the *Bismarck* and the Battle of Matapan, were caused by the absence of carriers.

In the official German report of the operations of the *Bismarck* group, the most difficult maneuver was passing through the Danish Strait, "due to the lack of effective air-naval support." Attempts of the *Focke-Wulf 200s* to reconnoiter the British naval dispositions off Northern Iceland proved a failure. These planes had to operate at the limit of their radius of action. Bad weather conditions which prevail in this area rendered these flights at maximum range ineffective. Lastly, and most important, the lack of an aircraft carrier in the German Task Force was

seriously felt when planes from the *Victorious* and the *Ark Royal* attacked the Germans on the evenings of 24 and 26 of May, respectively. By damaging the rudder of the *Bismarck*, the attacks left the ship to the mercy of Allied surface forces. Only shipborne fighters could have intercepted the attack of the old British *Swordfish* aircraft. All the *Luftwaffe* forces of Western Europe had been ordered to protect the German battleship, but the order was ineffective. The *Focke-Wulf 200s*, the only German planes able to reach the area of operations, were unable to engage the British carrier-based aviation at the exact time of the attack. The German report concludes that "in the absence of aircraft carriers, there was no way to aid the *Bismarck* with our air forces."

### The Italian Campaigns

In the case of seas like the Mediterranean which fell entirely within the field of action of land-based aviation, a different sense of security prevailed. Imbued with this false idea, Mussolini declared that "Italy is her own aircraft carrier, anchored across *Mare Nostrum*." Italian sailors doubted this strategy after their first encounter with the English on 9 July 1940. In this engagement, the planes of the carrier *Eagle* attacked the battleships *Cavour* and *Cesare* with torpedoes. Further doubts arose after planes of the *Illustrious* entered the naval base of Taranto on 11 November 1940 and torpedoed the battleships *Littorio, Cavour,* and *Duilio.* The Italian fleet waited in vain for news that the Italian Air Force had attacked the British naval forces. The Italian Air Force had vigorously demanded and obtained a monopoly in air operations on the grounds that land-based planes were sufficient.

In the presence of this deficiency, the *Luftwaffe*, a partner in the same strategy, dispatched its 10th Air Corps to Sicily, where it distinguished itself by damaging the *Illustrious* in the Sicilian Strait on 11 January 1941, a short distance from its bases, simply because the *Illustrious* possessed no fighter aviation. On the other hand, the problem was again presented when an attempt was made to operate against the English line of communications between Egypt and Greece. The Axis light-bombing planes had too short a radius of action to operate effectively from land bases. It was necessary, therefore, to attempt a raid by surface forces from bases in Taranto, Sicily, and the Dodecanese. These forces were to be protected by Italian and German aviation.

But once more, the lack of cooperation led to disaster. On the British side, the carrier-based planes of the *Formidable* insured success by accurate reconnaissance and effective attacks which reduced the disparity between the speeds of the Italian and British fleets. Only two *Ju-88s* from Sicily were able to intervene in the battle. This proves the powerlessness of land-based aviation in the face of prolonged action on the part of aviation based on carriers in the battle area.

In war, facts speak more loudly than high-sounding theories. After these unfortunate experiences, Italy diverted a considerable part of her feeble industrial effort to the hurried transformation of the liner *Roma* into an aircraft carrier. We do not know of a more striking demonstration of a forced conversion to the belief in the vital role of aircraft carriers in narrow seas.

On the Allied side, aircraft carriers alone were able to supply Malta with fighters until the Allied landing in French North Africa. These planes were launched off the Algerian coast and flew on to the Island. These carriers also provided air cover for the island's supply convoys until the Island's planes were able to take over effectively.

### The Pacific Theater

Disappointments arising from attempted

cooperation between naval and air forces were no less tragic in the case of the Japanese, particularly at the time of the Battle of Leyte. In this battle, the Japanese plan was based on the fact that both ground and naval aviation had at their disposal 70 "unsinkable" airfields in the Philippine Islands, while the American fleet was forced to depend on its carriers. As is well known, the difference between the results obtained by these respective modes of air-naval cooperation is another striking proof of the success of carrier-based aviation and the inadequacy of land-based aviation, even when the latter is stationed on islands in the battle area. This was true in spite of Japanese concentration of air forces and the beginning of *kamikaze* tactics.

During 24 October 1944, while the Japanese were advancing through the Philippine Sea—which was fringed with "judiciously located" friendly air bases—the Japanese naval forces were attacked by successive waves of American planes launched from carriers concentrated outside the Philippine Sea east of Leyte. As a result of these attacks, the battleship *Musashi* was lost. The following day, the main Japanese squadron, emerging from San Bernadino Strait, came upon the American escort carriers. But the Japanese commander in chief did not take advantage of this unexpected opportunity, because all the Japanese planes based in the Philippines were unable to give him the position of the main American air-naval force. He believed this latter force was on the point of encircling him. In reality, it was 300 miles to the north in pursuit of another Japanese fleet. In the south, the American fleet had emptied its ammunition magazines in the Battle of Surigao.

### The Coastal Command

Maintaining a permanent and adequate air cover with land-based aircraft above each convoy, when there might be no attack for months, would rapidly and uselessly exhaust even the most powerful air force.

Escort carriers economically insure this protection by having their planes ready but not in the air. At the same time, carriers provide the time necessary for their planes to get into the air by using powerful detecting equipment, which may be extended if necessary by floating or flying radar devices that also provide antisubmarine protection.

Increases in the speed and radius of action of land-based aviation will not change these facts in the least. On the seas, especially in protecting slow surface vessels, it is necessary to remain in open waters and to be present at the unexpected moment when enemy action begins. It is essential that one's means not be exhausted in advance by an extended, and therefore ineffective, disposition.

This close protection was felt so strongly during World War II, in spite of the most subtle arguments to the contrary, that every sort of method was used to provide convoys with shipborne aviation. These methods varied from the makeshift installation of a catapult for a fighter plane on certain merchant vessels down to the use of escort carriers, which were merchant vessels fitted out with landing decks.

No doubt the role played by the British Coastal Command in protecting sea communications will be cited as an argument against aircraft carriers. This command was organically a part of the British RAF, and during the War, the radius of action of its planes was increased greatly.

But is should be noted that the Coastal Command planes operated as "strategic" aviation, specializing in antisubmarine warfare, and consequently its planes were placed under naval command. Coastal Command had the mission of reconnoitering those areas of the sea that had to be

crossed by convoys, or of blockading the enemy's bases from the air. Coastal Command was not able to provide permanent tactical protection for convoys against submarines, and still less against hostile aviation. As a matter of fact, Coastal Command played the role of long-range naval reconnaissance aviation, and its success was due to the fact that it was in no danger of encountering hostile carrier-borne aviation. Its only floating adversaries were practically disarmed in the face of it.

### Strategic Role of the Carrier

If one will honestly consider the facts, the decisive role of shipborne aviation in all naval operations is evident, regardless of how close air bases may be. But the real strategic revolution which naval air has produced in modern warfare is that naval forces are at last able to act against the land, even to the most remote points of its most extensive areas. Instead of naval forces being doomed to play an increasingly reduced role in the future due to the development of the aerial arm, on the contrary we see it playing a more important part in the future against land areas. The development of naval air is a revolution in the art of war that has not yet been sufficiently emphasized.

Naval air can become decisive in certain phases of global warfare of the future. No longer is the coastal perimeter the only land area vulnerable to attacks from the sea.

It is important for the aircraft of the present and the robot weapon of tomorrow to be as free as possible from the restrictions of distance. The solution is simple: Make as close an approach as possible to the land area before launching planes or robot weapons. In the struggle along coastal areas, control of the seas will unquestionably be decisive in insuring air supremacy. The existence of a powerful fleet of aircraft carriers will assure air supremacy in the various theaters. It should not be forgotten that in 1945 American aircraft carriers at times dispatched from 1,500 to 1,800 planes in attacks on Japan.

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## Defense in Atomic Warfare

**Digested by the MILITARY REVIEW from an article by P. H. H. Bryan in "The Army Quarterly" (Great Britain) April 1949.**

THE first atom bombs were dropped on a faraway land situated in a section of the globe where, to the average newspaper-reading European, mass annihilation by earthquake and flood seemed to be a common event. In addition to this geographical remoteness, there has been thorough secrecy surrounding the whole project of atomic explosion. As a result, there is still an air of unreality concerning the atom bomb and its grim possibilities.

The British man in the street is perfectly aware that it is now a *fait accompli* and he may even have studied the casualty statistics of Hiroshima. He still finds it difficult to translate all this into the terms of his own secure little world. His attitude towards the atom bomb is a mild wonderment, then indifference. In the same way that the bush tribesman experienced no intermediate stages of introduction to aerodynamics, so most of us have had no gradual acclimatization to the unprecedented increase of killing power brought about by nuclear science.

Until 1945, all development of military weapons and equipment had proceeded, if not slowly and laboriously, then always on a scale that we could comprehend. Most so-called discoveries were but the product of

technical evolution, and by patient and methodical experiment eventually became accepted into everyday life as practical projects. The automobile, the airplane, the rifle, the machine gun, the grenade, and the old-type bomb—none of these were thrust upon the world overnight. The increase, throughout the years, of the killing power of explosive missiles, if shown on a single graph sheet, would show a gentle upward curve up to August 1945. Then a straight vertical line covering several graph sheets would be required to portray this new all-powerful weapon.

### Value of Present Defense

The escapist tendency to push unpleasant subjects to the back of the mind may be temporarily soothing, but it will not go far towards material defense of Britain in an atomic war. And, for that matter, neither will the 1943 type of defense. The one lesson, above all, learned from World War II was that the bomber will always get through. Figures now available from both sides reveal that a raid casualty percentage of 2 percent to 5 percent was considered a fair loss. Even more so will the bombers and projectiles of the present and future get through. The step-up of air speed, and consequently the element of surprise and invulnerability to anti-aircraft fire, is far outstripping the progress of their antidote in the shape of methods of location and interception. Speed is armor in the air as well as on the ground. The term "accuracy," when used in connection with the dropping of missiles, capable of damaging several square miles, upon large cities, only holds meaning for the scholar.

Whether the existing form of anti-aircraft defense—antiaircraft artillery, night-fighters, and searchlights—ever paid a dividend consistent with their cost and publicity is a debatable point. Some extremists say that if there had not been a single antiaircraft gun or night-fighter during the last War, it would not have made much difference to the final effect of damage to civilian property. And the condition of the heart of most of the large cities in Britain and of nearly all in Germany certainly lends creditability to this view.

However, any defense plans for a coming war must include, among other things, an acceptance of the fact that there is no way of keeping out the bomber or the projectile. It therefore follows that a considerable dislocation of transport and industry must be expected after the first atomic bombs have fallen. This disruption of civil life may not be entirely due to the actual material damage caused by the bombs. Although only three bombs may have fallen on Hull, Southampton, and Bristol, for instance, the effect of these may be to immobilize most civilian activity all over the country for the next few days. Crews will not venture down to the docks to sail the ships, railway staffs will not man trains, and telephone operators will hesitate to report for duty at their exchange in the city. Everybody will be fearful of the prospect that the next bomb may be on their particular locality, and there will be a general reluctance to go more than a few yards from the security—real or false—of the air-raid shelter.

If, under such conditions of chaos, large portions of the defense forces are dependent in some degree upon civilian transport, supply, or communications, it is inevitable that they will become isolated in the wave of confusion and will cease to contribute to coordinated effort. It is therefore imperative that the military forces of the country should be so formed that they will remain intact and organized no matter what devastation may be taking place around them.

### Base Fortress

One of the primary needs of any military force is a secure base. Under the threat

of atomic explosion, no huts, barracks, billets, tent camps, or, indeed, any surface habitation, can be classified as secure. This points to the creation of the "base fortress." The most available, most economic, and most effective passive protection against atomic explosion is to have several feet of earth over your head. The base fortress will be a defended center, with deep underground accommodation. It will possess a landing strip and be located in a rural area. It will have normal defense precautions against ground attack and will be camouflaged from the air. It will house a force of probably brigade or more strength, plus auxiliary services, the members of which will normally live in surface habitations nearby and only take up stations when a state of emergency is declared. It will have been stocked with ample rations of the "K" type and contain a water supply free from outside contamination. It will include space for casualty wards and mechanical workshops. Vehicles and aircraft will be stored in a hold on the aircraft carrier principle, and the naval methods of surfacing and taking off in a matter of seconds will be developed to precision. Such base fortresses will be connected by telephones with each other to ease the radio pressure, and, in aggregate, will form a network of self-contained strong points throughout the country.

The base fortress will be primarily the secure base of the striking force. The offensive role of this force, which will be mainly airborne infantry, will be to air-land in enemy country and destroy his atomic launching sites at the source. The slow-moving approach towards enemy territory of fleets at sea and motorized formations on land, which we have known in the past, will be too hazardous in the face of the danger of atomic bombardment. To indulge in wishful thinking to the extent of hoping that our atomic bombing of the enemy's cities will bring him to surrender will only set the stage for a suicidal and indecisive war of attrition.

The defensive role of the striking force will be to resist the bodily invasion of the nation. The enemy may use his atomic missiles on us and then sit back awaiting our surrender, or he may use them as a preparatory bombardment and then hope to invade under conditions of what he anticipates will be the subsequent confusion. His invasion will probably be airborne, but he may also gamble on a seaborne venture. Of course, it is quite possible that he may launch an invasion without any atomic bombing at all.

Since the first explosive missile was devised, it was evident that you could not profitably throw such a missile at the enemy and at the same time engage him in close combat. You cannot, for instance, hurl a hand grenade at a foe 6 feet away. During World War II, if you wished to throw large bombs at him, it was necessary to retire 1,000 yards or more. And now, in the post-1945 era, the terms are in miles and not in yards.

In order to gain a form of relative immunity from the atomic missile, one is faced with a variety of choices: to get well underground, a passive method which renders one temporarily inoperative; to be in a fast-flying plane, in which case one is, from a strictly military sense, similarly inoperative while the flight lasts; or to be at close quarters to the enemy, when he cannot use his mass-killing weapons without damaging himself.

Thus, the immediate tactical object of the attacker in atomic warfare will be to close with the enemy in the shortest possible time. With this principle in view, the invader of this country may deliberately air-land and occupy towns of no particular military value other than from being populated by thousands of our own countrymen. The immediate tactical object of the defender will be catch the invader out in the open away from any sanctuary, where

he can be atom-bombed without endangering others. Such areas will be the "killing-grounds."

### Killing Grounds

Whereas the location of the nation-wide base fortresses can obviously not be secret—which is no grave disadvantage—those of selected killing-grounds can. Such areas in which we can bombard the invader without slaughtering our own population will be chosen with the intent of enticing the enemy to air-land or sea-land on them. The inhabitants might be evacuated at the beginning of a state of emergency and a dummy occupation simulated by smoking chimneys, cars on roads, livestock in the fields, and other forms of deception. Better still, in the interests of security, a plan would be prepared (unknown to the local population) by the military authorities for an overnight civilian evacuation at any given time.

Such a network of base fortresses throughout the land would imply a considerable degree of dispersal of the country's military force. Under the new conditions of warfare, however, a concentration of force in any one area prior to the stage wherein close-quarter (and therefore non-atomic) land battles have developed, will only invite atomic bombardment. Furthermore, the base fortress is not to be regarded as a large dugout solely the property of its present occupiers. Collectively, they will form a nation-wide system of havens, landing fields, and supply replenishment points. No matter what the confusion of battle, there should always be a base fortress within some 20 or 30 miles.

Faced with a large number of base fortresses in all areas, the enemy commander cannot pin them all down. He will not know from which localities will come the comparatively small airborne reinforcements. They will travel in small numbers and from many directions and will converge to form a large body only when sufficiently close to the enemy in the "atom-free" area.

In the past, there has been a strong school of military thought which has opposed vigorously the principle of dispersal of force. The positioning of the French Army in 1940 is commonly quoted as an example of the adverse effect of scattered strength being too weak to resist a powerful blow in any one part. But what is sometimes overlooked is that mere geographical dispersion is not, in itself, the cause of inability to concentrate quickly at a given point. The true fault is lack of mobility. The large and cumbersome French Army was not mobile-minded or equipped with any means of fast transport.

### Striking Force

The striking force operating from the base fortress will move by air, not only because an extremely rapid means of concentrating at a threatened point is essential to counteract geographical dispersal, but also because fast air travel is by far the safest mode of transportation when atomic explosions are taking place in various parts of the country. Air speed neutralizes distance.

Apart from the strategical principle of a system of dispersed base fortresses, there is also the psychological one of morale. One of the great fears of the individual in atomic warfare will be that of being isolated and abandoned. In the confusion of war, even the best-trained units can get lost and lose contact with the main organization. A possibly devastated countryside, with its menace of radioactivity, will offer little comfort to lost groups. Neither will they be cheered by the prospect of wandering around for days on the naked surface of the earth, wondering when the next atomic bomb will fall. However, a base fortress network will insure for them, at a distance of never more than a day's march, a haven where they can sleep securely, eat and drink from uncontaminated sources, re-

plenish their ammunition, until they establish contact again with their parent formation. The base fortress will be as a raft to a tired swimmer. Who would grumble if it were a little crowded?

The base fortress must be considered as a base first and a fortress second. The striking force contained therein will not be the traditional garrison force, although it may have to conduct a static defense of the fortress in the event of a direct ground attack. The body of the fortress will be well underground. Only its eyes, ears, and fists will be near the surface, and these will blend with the pattern of the surrounding countryside. Although its exact position on the map will undoubtedly be known to enemy intelligence, nevertheless it may be exceedingly difficult for the pilot to locate it from the air or the infantry officer to find it on the ground. It will be sited with a view to defense from ground attack and contain the usual devices of mines, wire, and ditches covered by machine guns or fixed lines of fire and by a well-protected form of garrison artillery. The true strength of the base fortress will not be in its own potentialities of static defense, but in the mutual assistance it will receive from other base fortresses in the form of their counter-attacking striking forces.

### Defense Garrison

The permanent defense garrison will be comparatively small—probably not more than 200 or so. Its task, assuming the mobile striking force has flown off elsewhere, will be to hold off the initial stages of any ground attack until further aid develops. Incorporated with the static garrison will be the observer detachments, with their radar equipment, and an intelligence service. The latter will be the focal point of all information within the outside territory adjacent to the base fortress. One of the vital tasks of the intelligence service will be to watch for any signs of the enemy entering the prescribed "killing grounds." For this purpose, a small number of armored scout cars (proofed as far as possible against radio activity) will patrol the vicinity. Upon these will fall the unenviable tasks of venturing out after any local atom bombing to assess the damage and to detect any radio activity in the neighborhood. In addition to these mobile information gatherers, it is possible that a few well-protected and camouflaged outposts, for watching and listening, could be used to advantage, especially when they could be sited to cover a distant but clear view of a chosen killing ground.

The striking force, being mainly airborne infantry to whom the qualities of speed and precision in action are essential, and whose training in air-landing must be kept up to a high pitch, will need to be Regular Army men. The necessary standards cannot be acquired by immature youths passing fitfully and unenthusiastically through that year that lies somewhere between school and the first real job. Neither can the Territorial Army, with his erratic spare week ends, hope to attain the necessary degree of combat team efficiency. All the Territorials, therefore, will be utilized in the static and permanent services of the base fortress. In certain fields, such as medicine, mechanical and electrical engineering, and radio repair services, no particular military training is needed. The individual simply carries on his skilled trade from civilian to service life. Other duties, such as signalling, radio operators, garrison artillery, garrison machine gunners, require a training peculiarly military. Being of a static nature and involving mainly skilled manual manipulation, these duties can be taught and practiced to advantage during evenings and week ends. The Territorial soldier will spend at least his annual training in his local base fortress on the actual job that he will take up on mobilization.

It is not anticipated that a Home Guard

or any similar force will be usable in atomic warfare. Even in the last War's training exercises, the military commander, especially of a fast-moving unit, found the frequent appearance of unidentified armed men extremely confusing and the cause of false alarms and unnecessary delays. One is forced to the conclusion that an actual invasion in those days would have entailed many British Army versus Home Guard engagements. In atomic war, the military commander must have every military individual within his area well under control. There must be no loosely coordinated bodies of men of indeterminate numbers wandering in innocence over the selected killing ground areas.

**Summary**

The salient factors of defense in atomic warfare are as follows:

*The first object*—the protection of military forces from atomic bombardment. This will be achieved by the underground shelter of the base fortress and by a wide system of dispersion.

*The second object*—to permit military forces to concentrate at any point to resist bodily invasion. This will be accomplished because of, and not in spite of, the wide initial dispersion. The more numerous and dispersed the base fortresses, the less likely is the chance of their being pinned down by atomic fire.

*The third object*—to be able to use the maximum power of our weapons against the invader. In order to utilize the atomic missile in military defense, without damage to our own population, a highly organized and decentralized system of killing grounds must be prepared.

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## Discipline and Education

**Translated and digested by the MILITARY REVIEW from an article by Colonel Beernaerts, Commandant of the Ecole Royale Militaire, in "L'Armee-La Nation" (Belgium) 1 February 1949.**

FROM its construction, the word discipline originally must have been used to indicate the relationship between a master and his pupils and also to indicate the rules taught by the master. More generally, its employment is extended to mean "the implied or written regulations destined to insure good order and regularity in a group of individuals."

Military discipline is simply the application of this term to an organized group, the Army. Due to the nature of this group, its recruiting, and its reason for existence, military discipline has undergone changes through the years which have not always been parallel to the changes noted in civilian discipline. It is quite understandable that in armies composed of mercenary troops, often recruited from among the unlettered portions of the population or forcibly levied from the ranks of the peasants, it was necessary to impose rules of discipline that were rigid. The soldier was not asked to understand. He was ordered to obey, and the penalties imposed for the least infraction were extremely severe.

History teaches us, for example, that the Campania Legion, having sacked Reggio without orders, was called back to Rome and its 4,000 men were condemned to death. The sentence was carried out completely, and the Roman Senate even decreed: "The Roman people are forbidden to shed tears."

One easily sees that today, when all citizens are called into the military service, that discipline has assumed a different form.

### What is Discipline?

But let us attempt to define military discipline more positively. Belgian military leaders have defined it as follows:

"Discipline is a force which, from a sense of duty, causes us to carry out the intentions of the chief in the interests of all those affected.

"Discipline is nothing more than ideal duty made practical, introduced into the Army in the necessary form, transformed into positive rules for the use of the masses, and supported by penalties."

Though it appears unnecessary to prove the necessity for discipline, I believe, nevertheless, that it is necessary to examine its moral sources.

Discipline is based on sociological and psychological laws. That is one of the reasons why the teaching of the sciences has been instituted in the Belgian military schools, where it has assumed great importance.

There is a great difference between the various forms of discipline. There is the kind that makes an automaton of a man—strictly governing him by regulations, dictating his conduct down to the smallest details, constantly subjecting him to surveillance, and imposing punishment for every infraction. And then there is the form of discipline that is freely consented to and also desired by the subordinate.

We are quite aware that heavy-handed discipline is no longer in vogue. We are also aware that many laws and regulations stifle the concept of right and wrong, and that under such conditions the only thing that matters is escape from punishment. Such conditions can easily demoralize military forces.

On the other hand, all the proofs of political maturity that our people have given, all the evidence of fierce attachment to liberty, all the sacrifices they have made to possess it, permit us to envisage a form of discipline based essentially on the dignity and conscience of the subordinate, the authority and example of the chief, and the confidence the latter inspires.

Discipline such as this will be humane and liberal under a command that is strong and firm.

This form of discipline is more difficult to apply, and it requires an understanding on the part of the subordinate as well as that of the chief. It represents more risk than the older form, which was based solely on constraint and coercion. In many cases, it creates problems that can be correctly solved only by the subordinate's full realization of a sense of responsibility. In ancient times, it is said, one of Cyrius' officers was commended because the officer had allowed some of the enemy—who had already been vanquished—to escape in order that he could be on hand at retreat.

Today, discipline demands less obedience to the chief's orders and more intelligent execution of his intentions. Discipline is, therefore, wholly imbued with devotion, the spirit of cooperation, and initiative. The last factor formerly was forbidden. Discipline is made up of loyalty and honesty, which are inseparable from a sense of duty. It includes a broad knowledge of the military profession and the ability to employ this knowledge.

Though one may possibly conceive of education without discipline, it is impossible to imagine discipline without education. The correct execution of the intentions of the command implies, first of all, professional skill.

Lastly, in addition to authority, discipline implies good judgment and humanity on the part of the chief—in a word, the qualities which, it is agreed, are indispensable in those who command.

### Developing Discipline

We now examine the means and methods of developing the spirit of discipline in the student officer.

Those who are responsible for developing the spirit of discipline admit the difficulty of their task. It is possible only if both instructor and pupil give themselves wholly to the task with mind, devotion, and heart.

The job is to teach young men habits of orderliness and self-respect, to develop in them a feeling of fraternity and a spirit of solidarity, and to habituate them to serving generously.

It is important to awaken the conscience of the student as soon as possible and to see to it that he is acquainted with the conditions of his contract, his moral obligations, and his responsibilities and duties. Their observance is merely a matter of loyalty, and that is why honesty and uprightness are given first place in the moral structure of the school.

It is not the intention of education to make all minds the same. On the contrary, education tends to permit individuals to develop freely. At the same time, it brings about unity in achieving the general good.

Each individual must arrive at his own convictions, develop his mind, and build his muscles. New ideas or opinions cannot be blindly accepted. This is not at all contrary to the spirit of discipline.

Although we are able to understand why this does not permit an inferior to ask the "why" of every order given by his superior, we do understand that the discipline of today invites the chief to give this "why" whenever there is occasion for it.

These educational methods could and would seem quite weak if they were confined to the single argument of duty. Duty is often very dull, and youth demands something where emotion occupies a larger place.

Youth possesses a wealth of possibilities, enthusiasm, and liberality, which ask only to be used. I concede that there has not always been a way to do this and that much useful assistance has been lacking.

The educator has many spiritual factors at his command, and he is almost alone in being in a position to bring them into play because of his contact with his pupils. He will be able to do this if he has a generous nature and if he is not bound by regulations that are too strict. Fraternity and solidarity are components of the desire and the need of association which psychology reveals in the young. These are the virtues that are advantageous to develop in a little group whose members mutually support each other.

Usually, there is a spontaneous confidence on the part of a youth toward the leader closest to him. The youth very quickly takes the leader as a model, since, in his imagination, he sees himself clothed later with the same authority.

Youth is not, as a rule, presumptuous, except in words. It realizes, instinctively, that it knows nothing of life, that it has everything to learn; it naturally looks to the older person, the chief, as the one who represents tranquility and firmly established strength.

It is the duty of the chief in whom this confidence is placed to respond by understanding, affection, and like confidence.

Closer still to the youth are the upperclass students. This god-father relationship is traditional in the school, but it has always appeared to me to be automatic and ignored as a means of education by those in authority.

We could expect wonderful results from this if the educator could learn to lead the upperclassmen to take cognizance of their duty in the development of human solidarity. The good effects of this solidarity will be felt by all.

Lastly, discipline is acquired by example and by a sense of honor. This has been esteemed by the military profession in all ages.

Thus, we desire to promote this present-

day type of discipline, which is based on solidarity and confidence and gives the individual independence within the framework of the duties which he understands and accepts. We attempt to arouse in the individual the habit of reflection and analysis and to assure full development of his personality.

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# The Middle East

**Digested by the MILITARY REVIEW from an article in the "Australian Army Journal" June-July 1949.**

THE Middle East countries, Turkey, Syria, Lebanon, Israel, Egypt, Trans-Jordan, Saudi Arabia, Iraq, and Iran, occupy an area slightly smaller than Australia and have a combined population of about 62 million. Taken as a whole, the area is rich in oil but poor in most other resources. Its great importance lies in its strategic position astride the main communication routes between Europe, the Far East, and Africa.

## Geography

Considered very broadly, the area consists of the following:

1. A great arc of mountains in the north extending across southern Turkey and into Iran, containing a number of high plateaus.

2. The peninsular block of Arabia between the Persian Gulf and the Red Sea.

3. The corridor dividing the mountains in the North from Arabia and connecting the Eastern Mediterranean with the Persian Gulf.

4. Egypt, with its fertile Nile valley and surrounding deserts.

The most striking feature about the whole area is the general lack of water. The climate almost everywhere is one of prolonged or perennial drought. The summer months are especially dry. Only a few areas, principally northern Iran, northern Iraq, eastern Turkey, and the Mediterranean coastal region, have enough rain for normal agriculture.

The nature of the country can be classified into three major groups, true deserts, semi-deserts, and cultivation areas.

True deserts are those where vegetation is absent owing to lack of water and the nature of the surface. These deserts have a surface of either hard gravel, deep gravel and sand, or soft sand dunes. Some too have a hard volcanic surface. These areas are largely limited to Iran, the Arabian peninsula, and Egypt.

The second type, the semi-deserts, are vast tracts of land with a hard, dusty surface—except after rain—having natural waterholes and coarse vegetation in the hollows. This type of land is the most widespread of all and is especially characteristic of the northern plains between the Arabian peninsula and the northern mountains.

The third group, the cultivated areas, includes quite a considerable portion under irrigation and supports the bulk of the population in the Middle East.

## Inhabitants

The 62 million inhabitants are predominantly Moslem and are mainly of either Arab or semi-oriental stock. Of the minorities, the Armenians of Turkey and the Kurds of Iran, Iraq, Syria, and Turkey are the largest and most important. The Jews of Palestine, until recently a strong minority, have founded the sovereign state of Israel and by their victories against the Arab states in the war in Palestine, they have assured for them-

selves a position of great importance in the Middle East.

The table shows the approximate population and the size of the various countries in the Middle East.

### Middle East Oil

Apart from oil, the mineral resources of the Middle East are poor. Turkey does have an adequate supply of coal, iron, copper, and other minerals, but it is the only country in the area which has any mineral wealth other than oil.

The Middle East oilfields, for so long a vital source of British supplies, are now of great strategic importance. In fact, it is considered that Middle East oil is the greatest single strategic-economic factor in the world. Without it, the whole econ-

| Country | Area (sq miles) | Population |
|---|---|---|
| Turkey | 336,000 | 18,000,000 |
| Syria | 54,000 | 2,800,000 |
| Lebanon | 3,600 | 1,100,000 |
| Israel (a) | | |
| Egypt | 385,000 | 18,000,000 |
| Saudi Arabia | 350,000 | 3,700,000 |
| Trans-Jordan (a) | | |
| Iraq | 140,000 | 4,000,000 |
| Iran | 628,000 | 15,000,000 |

(a) To be included when Partition is final.

omy of Western Europe could easily become chaotic. In 1948, two-fifths of Europe's oil came from the Persian Gulf area, and by 1951 it is estimated that it will amount to four-fifths. The reasons for this dependence on Middle East oil are chiefly because the United States has become an importer of oil and that practically the whole of the Caribbean production will shortly be absorbed by the Americas.

Whereas the proved oil reserves of the United States total about 21,000 million barrels, those of the Middle East amount to 32,000 million barrels. Annual production in the United States is 2,000 million barrels against 425 million barrels in the Middle East in 1948.

The main oil-producing areas are bordering the Persian Gulf and north of the River Tigris in Iraq. Their geographic position in relation to Russia clearly indicates the strategic problem with which the Western Powers are faced as a result of their dependence on Middle East oil. Between them, Britain and America control over 90 percent of both production and reserve and are continually consolidating their position in the area. On the other hand, the Soviet Union has not been able to gain any control or concessions in the area.

### Strategic Importance

A glance at the map of the world will dispel any doubts as to the significance of the Middle East in relation to British Commonwealth communications. Not only does the area control east-west sea, air, and cable communications but, in addition, it constitutes the only land bridge between Asia and Africa, a factor which is certain to weigh heavily in any future world conflagration.

The importance of Egypt and Palestine as bases and the value of Iranian communications as an approach to the USSR were amply confirmed by events in the recent war. There is good reason to believe that they have since lost little or none of their significance in this aspect. The strategic importance of Middle East oil has already been dealt with in this article, and it is sufficient to stress here that its loss would, without doubt, place serious limitations upon the waging of an offensive war.

It is also difficult to conceive the successful prosecution of such a war from a Commonwealth point of view without the possession of land, sea, and air bases within the Middle Eastern area. Finally, were this area to fall into unfriendly hands, a serious threat would be created to the se-

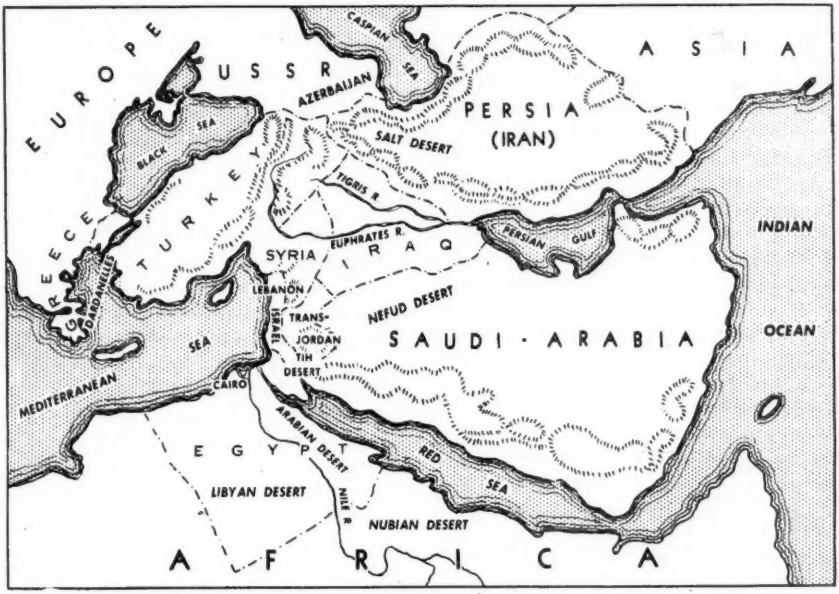
curity of the Indian sub-continent at a point where its natural defenses are the least formidable, and also to the security of the northwest Indian Ocean.

**Influences Being Brought to Bear**

It is logical that an area which is in itself a nerve center of communications and constitutes the gateway to four continents, and at the same time contains vast resources of oil, should be of paramount importance to the world powers who are either interested in maintaining or upsetting the *status quo*.

Long before oil attained its present strategic significance, the Russian desire to possess a warm-water port to provide an outlet for her trade led conflicting policies in the Middle East to the point of war. Now there is oil to be coveted and protected and in addition a host of considerations arising from the complexity of war on a global scale.

In view of the troubled nature of post-war events, aid against such a background as has been described above, it is small wonder that the interests of the great powers should clash in the Middle East. While one side seeks to consolidate its position, the other, by fanning the flames of each and every situation that presents itself, strives to aggravate the delicately balanced equilibrium of the Middle East and turn it to its own advantage.




The Soviet Union, having failed to make as much capital out of the Palestine dispute as doubtless she would have wished, must now look elsewhere in the Middle East to pursue her disruptive policy. While Soviet demands in respect to the Dardanelles are a constant threat hanging over the head of the Turkish state, it seems more likely that in the immediate future the Soviet Union will direct her attention to the renewal of pressure upon Iran.

# Communism and the Resistance Movement

**Digested by the MILITARY REVIEW from an article by Major Reginald Hargreaves in the "Journal of the Royal United Service Institution" (Great Britain) August 1949.**

WORLD War II reproduced a phenomenon, in the "'resistance" movement, which had not characterized strife between nations since the days of Napoleon. The military occupation of Germany in Napoleon's time gave birth to the patriotic "Underground," which went by the name of *Tugenbund*. In Spain, opposition to French suzerainty was vigorously sustained by bands of guerrillas, under local leaders, the activities of whose undercover component were of considerable help in the prosecution of Wellington's campaign in the Iberian Peninsula.

In the mid-years of World War II, history, with some deviation of detail, repeated itself. With the rapid expansion of the Nazi grip on Central and Southeastern Europe, the first whisper went about of sporadic efforts on the part of certain courageously defiant elements amongst the vanquished peoples to band themselves together to carry out such warlike measures against their conquerors as lay within their power. Thankful for any aid in the stupendous task which lay ahead, the British government and the several governments-in-exile were not slow to encourage the forces of the underground in Poland, France, Norway, Belgium, Greece, Yugoslavia, and Italy. Money, supplies, ammunition, and equipment were lavishly allocated to their support. In due course, selected officers were introduced into the respective territories to effect liaison between the military command outside the European fortress and those working for its disruption in the lands occupied by the Axis.

As time went on, brave tales were heard of the relentless mosquito-warfare waged by little groups of *Franc-Tireurs* against the victorious *Herrenvolk*. A romantic glamor came to invest the activities of the Partisans and "Men of the *Maquis*." The organization for their support underwent steadily progressive expansion.

On the return of the Allied troops to the mainland of Europe, and the eventual recession of the Nazi wave of conquest, the resistance movement undoubtedly played a useful, if somewhat sublimated, part.

## Communist Control

But uneasy suspicions had already been aroused that in many instances the underground was as much concerned with advancing its own peculiar political objects as it was in fighting the Germans. Gradually, and with a reluctance that sometimes resembled nothing less than willful myopia, the fact was brought home to the respective governments that these political objectives were invariably those dictated by a ruthless and entirely uncompromising spirit of communism.

This fact should have caused less surprise than it did. From the very outset, it had been plain that *virtually the whole of the resistance movement had been founded on the communist underground organization already in existence prior to the outbreak of war*. In many countries concerned, not only was it the most efficient organization, but it was the only one. Furthermore, being the first in the field, it was in an admirable position to absorb or eliminate any rival group.

In effect, the resistance was found to be largely a communist monopoly. Where a dissident minority struggled to remain in being, the threat to its continued existence by communist competitors was scarcely less formidable than the Nazi menace.

By this time, however, the underground

had become part of the over-all pattern of conflict. Its support was continued without any particular thought as to the consequences that would ensue when the liberation of the lands overrun by the Germans had been accomplished. The leaders of the resistance proceeded to cash in on the strength of their alleged contribution to the common victory.

Paradox and anomaly abounded in profusion. Not infrequently, British authorities, with the best intentions, found themselves in the position of subsidizing a group of extremist left-wing partisans whose principal aim (aside from the immediate obligation to fight the forces of occupation) was the extinction of a government-in-exile recognized by the Foreign Office.

### Situation in Greece

In no instance was this more starkly manifest than in Greece. The Greeks seized upon the German occupation as an interregnum in which to squabble over the political pattern to be adopted after deliverance, rather than as an opportunity to work steadily to hasten the day of liberation. This, while virtually a universal characteristic, was particularly true of the movement which, from its initials, came to be known as EAM/ELAS (National Liberation Front National Popular Liberation Army). By far the largest resistance force in the country, its policy and activity was entirely inspired and controlled by the KKE—the Greek communist party. It was not, as many people thought, a case of EAM/ELAS being captured by the communists *after* its inauguration. As Colonel C. M. Woodhouse emphasizes in his survey of wartime Balkan politics, "both were created and controlled by the KKE: not dominated or influenced or penetrated, but entirely created and exclusively controlled by the KKE." The KKE was a prewar communist organization that had flourished underground during the semi-dictatorship of General Metaxas.

From the outset, EAM/ELAS made it clear that it had the monopoly of the resistance. Since, in its view, support for King George of Greece was as unforgivable as collaboration with the Germans, the elimination of potential competitors was a matter of trifling difficulty. A campaign of vilification, in which they accused their rivals of being royalists or collaborationists, was usually sufficient to bring about submission. In extreme instances, EAM/ELAS was even prepared to drive the opposition into a position wherein the choice lay between actual collaboration, outright liquidation, or abject obedience.

If EAM/ELAS won, and continued to receive, British support, it was partly due to the fact that no other resistance movement exhibited the same quality of continuity, and partly because the KKE was careful to obscure its ultimate, relentless design.

### Other Balkan Countries

Conditions in the other overrun Balkan countries showed small variation on the setup exhibited in Greece. In Albania, such resistance as existed was under the direction of the avowed communist, Enver Hoxha. Dimitriov, in Bulgaria, was adorned with the halo especially fabricated for him by the Third International in recognition of his defiant showing at the German *Reichstag* fire trial. He was supported by Georgiev, a bird of the same hue. In Macedonia, the dissidents were under the control of Rhodhopoulos, alias Radev—a Greek by birth, a Bulgarian by adoption, and a red-hot communist by conviction.

Yugoslavia presented the extraordinary spectacle of the first resistance leader—Mihailovich—being driven to seek the acquiescence, if not the actual aid, of the occupation forces in his struggle against the rival communist underground of the Kremlin-sponsored Tito. The latter was

an apt pupil of the Moscow schools of instruction.

To the unhappy Mihailovich, the alternative of conquest by the Nazis or subjugation by the communists was no more than the choice between consumption piecemeal by a single lion or being gnawed to death by a thousand rats. Yet the transfer of British support from him to his rival entirely stultified Mihailovich's long-term plan to deal first with the communist horror before turning to aid in the liberation of his country from the evil sway of the Nazis.

At the same time, it has to be confessed that the dilemma which confronted the British authorities—whether to continue the support of a "collaborationist" or to accept in his stead a protege of the Kremlin—was one as remote from satisfactory solution as anything well could be. But if Mihailovich was ultimately driven to accept German aid in his fight against Tito and his communists, the blame must rest as much with those who sponsored Tito as with the man who was left to become his victim.

### Situation in France

Where French resistance is concerned, the same general pattern is to be observed, with modifications reflecting local conditions.

In France during prewar years, communism had not found it necessary to go underground. Many of its activities were temporarily condoned. It openly contributed to the embarrassments that undermined the stability of the government of M. Blum. Its demand for shortened hours and its policy of "go slow" in industry helped materially to sabotage such preparations for active warfare as France had belatedly undertaken.

The French communists maintained the machinery of an elaborate underground-in-being even after communists were represented in the Chamber of Deputies.

With the collapse of France in 1940, the spirit of resistance flickered once more faintly into life. Since at first it had to work in secret, some form of undercover organization was essential. Again, the elaborate machinery of the communist underground was ready and waiting. Not only was it the sole suitable organization in being, but in resource, experience, and integral discipline. It was in a class by itself. This ready-made organization, into which the resistance movement could so easily be fitted, gave the communists an enormous start and tremendous advantage over any rivals. The same was true in Belgium and Italy. In Poland and Norway, no such predominant communist influence was to be discerned.

Naturally, as it increased in size and influence, increasingly amplified by Allied military authorities, the resistance assumed great importance in its own eyes. Yet, even from within its own ranks, there were voices to question the validity of its self-esteem. As the Gaullist agent "Remy" (Gilbert Renault) is at pains to emphasize in his book on underground activities in France, "the resistance movement was a microscopic minority until the end of 1942; the communist *Franc-Tireurs* and Partisans started a little fighting in 1942; the *Maquis* movement was first formed in 1943." Bénouville, another chronicler, has made the illuminating comment that "the men of the Left too often loved the Internationale more than they loved France"; he dismisses the communist contribution to the overthrow of the Nazis as "beneath contempt."

In effect, in France, as in Italy and the Balkans, the communist-controlled resistance was far less concerned with helping the cause of the Allies than exploiting the war conditions to further their postwar plans for world domination. Always, overriding every other preoccupation, the communists bore in mind the primary doctrine that:

1. The communist aim is revolution.

2. That revolution must be brought about by force of arms.

3. That it must be world-wide in character and based on Russia.

4. That at the most suitable moment, Soviet forces must cross the borders of other states to assist in their "liberation."

5. That no permanent peace between the communist and non-communist worlds is possible.

At what hour communism should come out into the open in belligerent defiance of its temporary capitalist paymasters was, of course, no business of the mere rank and file. That was a matter to be determined by the hierarchy. In the meantime, the password had been given by Stalin: "We are living not merely in a state, but in a system of states, and it is inconceivable that the Soviet Republic should continue to exist interminably side by side with imperialist states. Ultimately, one or the other must conquer. Pending this development, a number of terrible clashes between the Soviet Republic and the bourgeois states must inevitably occur."

Such was the doctrinal background of the men dominating the resistance in four-fifths of the territory overrun by the Axis Powers.

That the communists' carefully screened hostility of the war years has now become open enmity is abundantly plain from the recent utterances of Thorez, in France, and Togliatti, in Italy. We know now, from their own lips, that in the event of an armed clash between East and West, the communists for whom these leaders speak may be expected to range themselves on the side of democracy's bitterest enemy.

That these left-wing extremists are still blandly cashing in on their association with the wartime underground, however, is witnessed in the terms of the award in the recent Kravchenko libel action in Paris. The judge informed the defendants that "in assessing the penalties, their record in the resistance had been taken into account." In effect, their reward for being good Reds was that they were permitted to indulge in a communist smear-campaign at considerably cheaper rates than if they had belonged to any other party!

### The Future

Concern, however, is not so much with the past. What of the future? On certain points, there is little room for doubt.

Communism is a creed, an obsession, a way of life, a grudge, and a disease. Even more important, *it is a plan.* In the grand design that communism envisages for the future, a clash between the disciples of Marx and Stalin and those who stand for the Western concept of democracy is predicated as inevitable. When that day comes—if come it does—in such sectors of the Western mainland where anti-communist forces retain a foothold, the resistance will go into action in its true colors. Its organization has been perfected by the experience of the recent War, its mechanism streamlined and admirably geared by the process of trial and error. Any attempt at an opposition underground will be stultified from the very outset by men who will be thoroughly familiar with every trick of the trade. Subsequently, in the wake of the retreating communist hordes, a whole network of skilled resistance will be left behind to work the mischief in which it is already so extensively practiced. Allied soldiers will be shot down with weapons purchased, in earlier times, with Allied gold.

Looking back over the recent War, there is scant reason to question the validity of the old proverb which tells us that "adversity brings strange bed-fellows." It is a matter for serious consideration whether the value of resistance movements is in any way worth the miseries and dis-

asters brought upon the civil population by their activities at the time, or the endless trouble those self-same activities inevitably lay up for the future. In any future war, the resistance, too faithfully resembling a boomerang, would on the whole be far better left alone.

That military opinion will be likely to concur in this contention is improbable. Through the very nature of its task, the military mind is committed to relatively short-term views. Its overriding consideration is to achieve victory at the earliest possible moment—by any means. But there are some means to an end which endanger, as they defile, those who make use of them. It is for the responsible statesman to take the long view and to bear carefully in mind the fact that victories won by corrupt, ignoble, and untrustworthy agencies bear within them the seeds of their own destruction.

By all means, in wartime, employ the customary agents—a well-devised counter-espionage organization, even a loyal and dependable "Fifth Column." But a resistance movement which, however well-intentioned its beginnings, will gradually yield to communist infiltration and ultimately submit to absolute communist domination—*no*. The game simply is not worth the candle.

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# Air Security of Troops

**Translated and digested by the MILITARY REVIEW from an article by an officer of the former German Luftwaffe in "Flugwehr und -Technik" (Switzerland) June 1949.**

BETWEEN World War I and World War II, the protection of marching troops from air attacks was not given much attention. Open formations were assumed during the march principally to counter enemy air reconnaissance, rather than to give protection against air attacks. Increasing the intervals maintained by a column of troops on the march was intended to facilitate taking cover from attacking aviation and preventing the jamming of the column. Writings of that time indicate that marching troops were considered to be little affected by either the planes' weapons in low-flying attacks or by bombs released in high-altitude attacks.

In 1930, defense authorities took the stand that, from the standpoint of the fliers, it was foolish to attack marching forces. From the point of view of the ground forces, it was considered useless to resist chance attacks from the air by interrupting the march. The reasoning behind this theory was that casualties resulting from air attack were insignificant and that the halting of a marching column indirectly made the air attack a success.

## New Concepts

These views have been completely changed as a result of World War II experience. From the Polish campaign to the Anglo-American invasion, the importance of attacking all march and transport movements of an enemy was proved conclusively. It was shown that with increasing air superiority the movements of an adversary could be crippled to an increasing degree. On the other hand, one's own movements could be executed with increasing ease and lack of interference. Mobility is the first prerequisite of operational activity. An immobilized army is no different from an encircled force. Indeed, its situation is worse. It is no longer able to break out. It uses up its ammunition, its rations, and its motor

fuel, with no hope of replenishment. It can offer local resistance only for a limited time, until it capitulates or is broken up. The Germans got into this situation in the spring of 1945 as a result of the absolute air superiority of the Allies.

The words "air superiority" do not explain everything, however. Even a weak opponent, through skillful choice of time and place in his air attacks, is able to gain temporary and local air superiority. There is also the question of whether his air arm can permanently interfere with the movements of the enemy's forces.

With the loss of one's own fighting power in the air, the ability to influence an enemy's mobility drops automatically. Meanwhile, the enemy's ability to interfere with our own movement increases. This is true if the enemy air attacks produce sufficient material and moral effects and if the attacked forces do not succeed in escaping from these effects by active or passive defense.

Just what were the effects of air attacks on ground forces and their movement during World War II?

Countless examples from all the campaigns show that those attacks which were of decisive consequence were those which were directed against motorized forces and railway transportation. Generally, the destruction of war material and transportation led to a decisive decrease in the enemy's combat ability and mobility, while personnel losses were a matter of relative unimportance.

Similarly, all campaigns showed that ground force personnel losses assignable to air attacks, whether on the march, in assemblies, or in combat, rarely reached an extent which decisively affected combat power. Hence, with material effects negligible, the moral effects of air attacks are to be estimated more highly, and the numerous descriptions in the military press of all nations show what crushing effects air attacks usually had on ground forces during World War II.

As a result, the significance of the moral effects of air attacks are not to be underestimated, and commands must take these effects into consideration. They must give the matter due attention and take all steps possible for decreasing the material and moral effects of enemy air attacks on their troops. Measures which serve to protect ground forces in operational areas and on the field of battle are deployment, camouflage, concealment, air warning network, and antiaircraft defense.

Assuming an open formation, even down to the rifle squad, is the simplest and most common way to meet enemy fire and to avoid losses. In the past, it was infantry and artillery fire which determined the point at which deployment was necessary. Today, aviation determines when formations are to be opened up. In the present era of jet-propelled aircraft, we have to expect sudden attacks without warning at distances up to 90 miles back of the front. Therefore, the cumbersome features and difficulties of command common to open formations on the march in daylight and conditions of good visibility must be endured at an early stage. Depending on the seriousness of the air threat and the peculiar nature of the terrain, the commander will have to choose between marching over highways in more or less open columns or marching cross-country deployed in combat formations. Even at night, the use of parachute flares may force units to adopt security measures similar to those employed during the day.

### Camouflage

Camouflage, in its broadest sense, comprises the following:

The greatest possible blending with the terrain.

The use of natural or artificial cover for concealment.

Deception of the attacker by using dummy installations or deceptive marches.

Selection of certain colors for camouflage is of secondary importance. There is no color suitable under all conditions. In every type of camouflage, the degree to which sharp contours, shadows, and the development of dust are avoided is a matter of decisive importance.

The forms and shadows of halted vehicles, guns, and tanks are best eliminated by the use of camouflage nets. All regular forms, especially when recurring, are noticeable and revealing, and therefore to be avoided. Vehicles standing in the shadow of buildings or in the shadow of the trees on the edges of woods or clumps of trees are less conspicuous than vehicles standing in the sunlight. Attempts to conceal guns or vehicles from aviation by attaching branches to them are impractical. As a rule, the particular equipment, imperfectly concealed, will catch the attention of a flier even more quickly. This attempted camouflage is especially dangerous when the foliage employed begins to wilt, as it does during long halts. On the other hand, this method of camouflage may be used to advantage in the case of dummy equipment.

The same means that are effective for guns, vehicles, and other apparatus are suitable for the troops themselves. All movement in the open is to be avoided, as far as possible.

If forces, because of their particular mission, are forced to move without regard to enemy air observation or threatening attack, then, of course, the same principles apply as for movements under enemy infantry or artillery fire. In such a case, taking advantage of shadows plays almost a greater role than taking advantage of the terrain. Dead angles are meaningless as cover from sight and fire, when aviation is concerned.

The most dangerous revealer of all movements is highway dust rising high into the air. With good visibility, this will reveal the presence of marching forces, with or without vehicles, at distances as great as 20 miles. Hence, dust plays the same role in the daytime as light does at night, only it is far harder to deal with. To a certain extent, though, means of combating this condition do exist, such as the use of sprinkling vehicles, though we have never heard of their being used. Oil is useful for holding dust down. On asphalt highways, dust development is much less than on macadamized or dirt roads.

Winter camouflage has its peculiarities. Snow-covered terrain offers both advantages and disadvantages as regards camouflage. With sufficient care, trails left in snow may be effectively erased. Dust drops out of the picture as a betrayer. On the other hand, the smoke of campfires plays a similar role, as does also the smoke from Diesel motors. An air enemy may be easily deceived and misled by means of smoke. In this connection, it may be mentioned that poor results were obtained by the Germans from the use of smoke screens for protection against air observation. Even with the most intensive employment of smoke generating equipment, the Germans never succeeded in obtaining an effective surface screen of sufficient density, permanence, and thickness to conceal attack objectives. On the contrary, the smoke screen, like any other smoke that was developed, revealed to the attacker from a long distance that an important target was to be found there.

Darkness offers the surest protection for all troop movements. Yet, by

the employment of airplane parachute flares and searchlights, it is possible for attacking planes to at least cause serious interference with movements on the principal highways. At night, however, one will usually succeed in keeping a steady flow of traffic in motion on secondary highways and dirt roads. Traffic control is also necessary.

It is important that the troops be made aware of the extent to which they are in danger of air attacks. Even though careless conduct must be energetically combated, it is necessary to guard against the creation of an anxiety complex on the part of the troops, as was unquestionably the case in Germany during the War. It is ridiculous, for instance, to take a soldier to task over a lighted cigarette at night, accusing him of potentially provoking an air attack. Naturally, discipline is to be required in the use of open lights and fires, and caution in all other respects is to be expected. The troops, however, must absolutely possess the confidence that they will be able to execute movements by observing safety regulations, in spite of the threat of enemy air attacks, just as they are able to execute movements under the fire of ground weapons.

### Concealment

Artificial means for concealment are applicable almost solely to positional warfare. Here the problem to be solved is not that of concealment of the troops themselves and their vehicles. Rather, the problem is one of concealing certain highway and terrain sectors, battle positions, rifle and communication trenches, sections of woods, ammunition and fuel dumps, and making the evaluation of air photographs difficult or impossible. The amount of material required for this type of camouflage is enormous, since success can be achieved only by the use of camouflage nets. Frequent attempts of troops to use tree and bush foliage for camouflage purposes is quite foolish and useless, for the reasons already given. Money should be no object as regards good camouflage equipment, and this equipment should be available in peacetime, just the same as ammunition and other supplies. Good camouflage saves men and equipment.

The same can be said about deceiving the enemy by means of dummy installations and equipment which, in time of war, are supplemented by searchlights. In many cases, the fighting forces themselves will have to install these installations, but it is recommended that the combat forces be relieved of this task as much as possible. Camouflage units composed of older men or those unfit for field service should be used for such work. Naturally, such units, equipped with camouflage and deceptive equipment of all sorts, will soon do a better job, under skillful and resourceful leaders, than the combat forces.

The handling and maintenance of camouflage and deceptive installations requires training and practice if these are to be effective and save the men and equipment of the combat units. Camouflage forces can be valuable auxiliaries of the command. At times, in Germany, up to 30 percent of the bombs dropped by the Allies fell on dummy installations. In England, some of the dummy installations were even more successful. In a single night during the winter of 1940-1941, more than 300 planes of the German 3rd Air Command dropped their entire load of bombs on dummy installations south of Liverpool.

### Deception

Of all camouflage means, however, active deception pays the best of all. This is true both with reference to the field of battle and to all movements in the operational area.

Under the heading, we have feint marches, dummy camps, dummy positions, artificial tank tracks, the use of dummy motor vehicles, guns, and tanks. Whenever possible, these measures should be associated with antiaircraft-gun concentrations. It is important that dummy equipment should be mobile, either towed by light vehicles or drawn by a rope or cable. The employment of light and medium antiaircraft guns in connection with all dummy installations is imperative. Since real movements are, in all cases, protected by antiaircraft artillery, the absence of antiaircraft artillery would be immediately noticed and would betray the dummy installations as such.

Since, finally, all movements cannot be completely camouflaged, protection against fire and bombs also plays an important role in preventing unnecessary losses. No ground vehicle can escape aviation fire by its speed. Even when columns are opened up to as great an extent as possible, individual motor vehicles are paying targets for light fighter aircraft. Hence, in the future, transport vehicles protected by light armor, as well as regular armored vehicles, will be given greater attention. They must afford security from fire from above and from bomb fragments from the sides. Naturally, it is impossible to provide all motor vehicles with armor. But for day use, armored protection will be imperative.

In addition to the few natural possibilities for cover, such as railway and highway tunnels, the shelter hole, both for men and vehicles of all sorts, plays an important role. Troops must become accustomed to constructing well-concealed, one-man shelter holes whenever the soil permits, even during short halts. During longer halts, and especially in positional warfare, the construction of cover, even for vehicles, is a matter of great importance. The cover to be found in gullies or alongside natural slopes may be employed for this purpose. Camouflage must be remembered with the removal of the first shovelful of earth. Uncamouflaged shelters of this sort are useless. Every shelter hole dug is a sort of capital investment which benefits not only the one who constructs it but also all forces which follow.

But neither camouflage nor cover are of any value unless coupled with an air warning system based on the most careful air observation.

During World War II, one of the most important lessons learned from the experiences of all powers was that the density of fire attained by the employment of all available antiaircraft weapons did not prevent an enemy attack. The strongest concentration of weapons of all calibers was required just to interfere effectively with an air attack. This discovery is analogous to that made in connection with the employment of ground artillery. Any scattering of the employment of that arm reduces the chances of success at decisive times and in decisive places.

Only an antiaircraft artillery command that is closely coordinated with the ground combat command will be able to use its equipment in such a way that its fire will effectively support the main effort. We do not deny that for a short time the employment of a single platoon or even a single gun has been of moral and even of tactical advantage. But such cases are exceptional. Long-continued practice of this sort means only a waste of strength and ammunition.

Lastly, in those places where the tactical situation requires troop movements without regard to enemy air threats, it is necessary to concentrate antiaircraft artillery of all calibers at the most dangerous places along the route.

It goes without saying that every unit ought to participate with its own weapons in the fight against low-flying attacks. Even though this does not guarantee any certainty of success, it nevertheless heightens the moral effectiveness of the defense. Damage inflicted on planes, may, at least, cause the enemy planes to miss one or two flights. Fear of betraying one's position to a low-flying attacker by rifle or machine-gun fire is unfounded. The attacker is much too occupied with observation itself, during the few moments that he is exposed to the defense fire of the infantry weapons, to be able to note details. He is not attacking the individual man. He is assaulting the movement. Moreover, for morale reasons, self-defense on the part of the unit is necessary. It gives a greater feeling of security.

### Conclusions

It has not been possible, here, to consider all the problems of air security. We have been forced to limit ourselves to calling attention to their number and to indicating possible solutions. The discovery of these possibilities and their application to the needs of the urgent problems of national defense will be the task of those charged with solving the problems of the modern air security of military forces. The lessons learned in this field by all the belligerent powers in World War II bring home to them the necessity of intensifying training and practice in air security.

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## The Engineer in Land Warfare

**Digested by the MILITARY REVIEW from an article by Major General Sir Eustace F. Tickell, in the "Journal of the Royal United Service Institution" (Great Britain) August 1949.**

A MODERN mechanized army depends for its terrific power to move and hit upon engines—tens of thousands of them. Wars are no longer fought by men and horses, but by men and horse power, with the result that a high proportion of the men are engineers, in that they deal in some way with engines. These men exist in every arm of the service.

There are certain corps—for instance the Royal Mechanical and Electrical Engineers—who consist almost entirely of highly skilled and highly trained officers and men, all of whom are engineers in the modern meaning of that word. Long ago, however, an engineer meant a man of genius, or at any rate of ingenuity, who devised and operated "gins" or "engins." Men of his type were used in armies to work the catapults, battering rams, and other forms of engineer equipment employed in building, defending, and attacking fortresses. From these ingenious fellows grew the Corps of Royal Engineers (RE).

Since the advent of the internal combustion engine, the RE can no longer claim to be the only, or even the largest, collection of engineers in the Army. On the other hand, the duties of engineers other than Sappers are fairly well laid down. Their own tasks are allotted to the several technical corps and to the technical members of all arms. But the tasks remaining to the RE are not so clearly defined. I shall, therefore, deal mainly with the place in land warfare of the RE.

The engineer stands in the place of the residuary after all specific legacies have been allocated, and he never quite knows until the time comes what he is going to get. Although so much engineering is now the duty of others, an ever increasing amount seems to be left over for the

residuary legatee. This should surely cause no surprise. The modern mechanized army is a thing of tremendous power, and one man in the front line can now do things that thousands could not have done before mechanization. But there is another side to the picture. This endowment of the fighting man with such powers to shift and strike must be paid for by great increases in the efforts supporting him. Mechanization has increased considerably the demands made upon the engineers in the forward areas, but it has also created greater demands in the rear echelons.

### The Engineers' Tasks

The engineers in the past have been concerned with many activities, and it has been our custom to throw some of these off when they became too big, or when it seemed better that they should stand on their own feet. For instance, we were concerned with the infancy of naval mines and torpedoes, signals, searchlights, sound ranging, trench mortars, and even aircraft. At the time of the Boer War, we drove the first military motor transport. The experiences of many wars have shown that something brand new is liable to drop into our laps as the result of the ever-changing technique of fighting. I cannot help thinking that it is a good thing for the Engineers to *start* a war with their hands not quite full. We are, however, trying to take steps to grow a bit, so that we shall be in a better state to meet the unknown new jobs that are bound to arise in the future.

### Mines

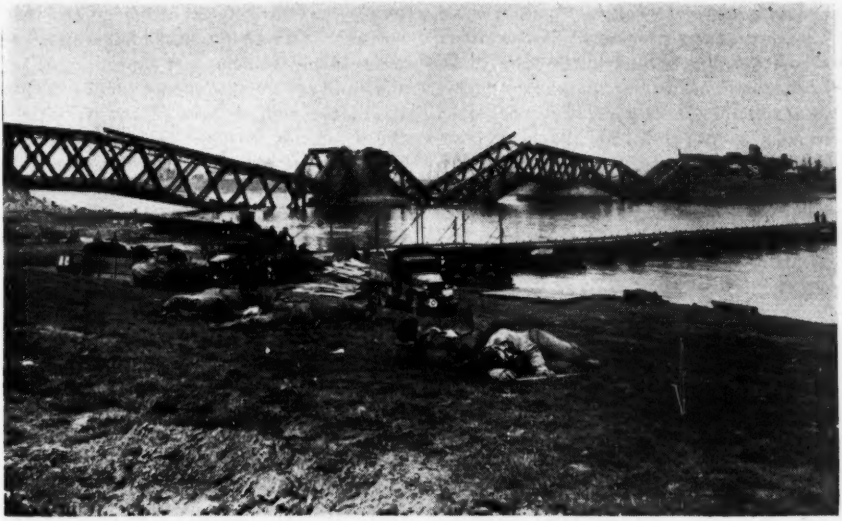
The barbed wire of World War I has, I think, been largely replaced by the mine, and I am one of those who think that World War II may have left us rather complacent about the mine. The Western Desert was definitely not a mine country—there was too much of it. After that, the Germans never really had the facilities to lay mines in quantity. Not until nearly the end of the War did they begin using really difficult mines. It does not require much imagination to foresee a time when combinations of mine fuses will have defeated all possible antimine devices. Then the mine will become the Queen of Battles—the weapon with no answer and no antidote.

Is this mine-laying, mine-detection, and mine-lifting really engineering? I think that it must remain one of the engineer tasks. We must have a body of people who exist from the front to the rear, for remember that during advances the mine menace is just as bad in back areas. There must be people who are forever studying changes in enemy fuse technique, perfecting their own, and, what is very important, surveying, and trying to record our own and enemy mine fields. I think the engineers are the best people for this.

The study of mines is closely related to that of bomb disposal, and this rather thankless task must, I think, also remain with us. Incidentally, it often involves fairly heavy timbered excavations, pumping, and tunnelling. I do not think the RAF wants to take it all over, although presumably it is someone's air force, and not their army, that drops these things around.

Now to the front line itself. Who can say what the future holds in store, supposing we are on the defensive? Shall we go back to that vast slough of very demi-semi-engineering—trench warfare, with all its dugouts, mine galleries, tram-lines, pumps, and gas? Will the pillbox, requiring 200 tons of reinforced concrete at a time, come back into favor? Will even deeper and stronger foxholes be wanted against the new weapons? We must at least be ready.

In the offensive, when it comes, there will, as already mentioned, be mine detection and destruction problems, which are almost certain to be even more difficult



**One of the principal functions of engineers in land warfare is the construction and maintenance of bridges of all kinds. Above, the first ponton bridge built across the Rhine River in the 9th Army sector of the 21st Army Group; below, a pneumatic ponton bridge constructed with 28-foot floats.—US Army photos.**

than any we have ever yet tried to solve.

Against enemy permanent fortifications, we are now able to offer a new form of assistance with our armored assault vehicles. I am sure they have a great future, and I am equally sure that they should be manned by Royal Engineers. The armored assault vehicles and the bulldozers went ashore early on D-day and helped with the many jobs that fell to the engineers during assault landings.

### Bridging

Now I come to our traditional task—helping armies cross natural obstacles—in a word, bridging assisted by rafting. This bridging problem has become very different and difficult. It is much more important now that armies can move much faster and farther.

When I joined the Army, we had two types of bridge—one for men in single file and one for men four at a time, which carried all other traffic except a few heavy guns and howitzers. Since then, although the lightest loads have not changed, the heavy ones have grown tremendously. We managed to cover the spread between the loads in World War II with only one bridge—the Class 15 to 40 that took everything up to tanks. We had a quickly erected, light, floating, temporary, and wobbly truck bridge, and could strengthen our Class 40 bridge to take tanks on their transporters. The Class 40 bridge was the main one.

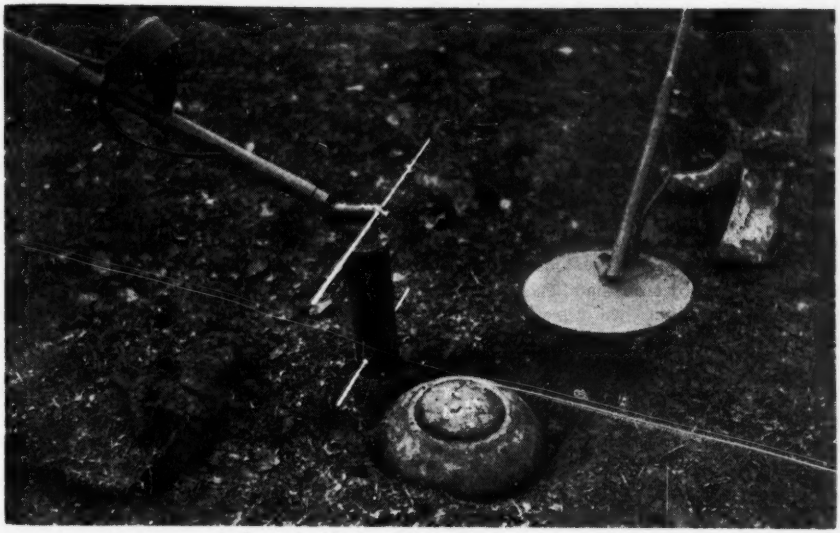
We are now faced with the problem that front-line fighting vehicles may require bridges far stronger and far wider. If we are not careful, we shall spend our time bridging quick and light, and then having to replace immediately by something stronger and wider. As a result, twice as many men will be tied up, and twice as much transport required to move this duplicated mass of steelwork from the base to the front. The increase in width and loading, in other words, is tending to make us employ too many types of bridge and raft.

There is another aspect of this problem. Many army vehicles are now too big for the railways and too heavy for the majority of the civil bridges of the world, but these vehicles must get into the battle. It is quite clear that we shall not only have to replace blown bridges, but we shall also have to replace or reinforce large numbers that have never been touched by the enemy or our own Air Force. This assessment of the strength of existing bridges and the improving of their carrying capacity may well become a major task, one which will require specialized technique and a good deal of arithmetic. There are many who think that in the past we have often been overly cautious in applying our factors of safety. I do not agree; but anyhow, future loadings are going to break or, at any rate, kink many a camel's back.

However you look at it, the bridging problem is bigger than it was. We built over a hundred miles of bridges in World War II, and experience showed that, just as a tank only goes a mile or two to the gallon, so does an army only go a mile or two to the bridge. Both the 21st Army Group and the British Army in Italy each wanted over 1,500 bridges. Do not think that desert countries require no bridges. We had to bridge the Nile three times, the Suez Canal five times, the Shatt el Arab at Bazra and the Euphrates in full flood. All these crossings required very heavy bridges.

### Road Making

Bridging leads naturally to the road problem. From the engineer's point of view, it is a curious thing that the more mobile an army becomes and the greater the country-crossing ability of its vehicles, the more it demands strong, wide, and dependable roads. It is not the front-line troops that do the damage, but that endless stream of follow-up replacement and maintenance vehicles which mechanization



**In World War II, land mines of all descriptions were used by both sides. The engineers generally were charged with the responsibility of detecting and removing mines, as well as laying mine fields for their own side. Above, a detector locating a plastic mine; below, railroads are operated by the British Engineers.—US Army Photos.**

has made possible and absolutely necessary. It is lucky that the Western Desert and Northwest Europe campaigns were fought on passable desert and one of the best roaded areas in the World. In Italy and Burma, things were far more difficult. Even so, the Middle East campaigns demanded some 2,000 miles of brand new road in Egypt, Palestine, and Libya, and great efforts in the maintenance of all existing roads. In Northwest Europe, the effort expended by troops and civilians was great. At one time, we were quarrying and using 10,000 tons of stone a day—a tonnage which eclipsed all others.

Will this problem get any smaller? In my opinion, quite the reverse. I have had to maintain a lot of roads, and the difficulty has nearly always been the shoulders. In the future, with wider vehicles, I am sure that this wearing at the edges is going to increase our troubles considerably. However cunningly our forward vehicles are designed to let them cross sand or swamps, I do not believe we shall ever be free from great numbers of standard commercial trucks immediately behind the fighting front. Such trucks are designed for and demand proper road surfaces.

### Airfields

Similar to the road problem is that of airfields in the land warfare zone. We managed—just managed—in the late war to provide adequate fields to keep the aircraft operating in the air with the Army. For various reasons, this task is becoming increasingly difficult. The conventional airfield for even the smallest machine is a big thing. One runway is equivalent in area to 30 miles of the width of road we used from Alamein to Tripoli. The problem of the future, though, is not so much that forward airfields will get much bigger, but that they may have to be made far stronger. Instead of thin skins of tarmac, steel sheets, wire mesh or even roofing felt, which was often so very effective, we may easily be faced with having to produce a surface akin to a first-class road or else made of steel so thick that transporting it to the site by sea and land will be very difficult. It is idle to hope that our airfield commitment is going to become any smaller; it took a high proportion of our engineer effort throughout World War II.

One word about demolitions. Luckily, they did not figure largely as a British Army hobby in the last War, but we saw enough of the effects of wholesale German demolitions, combined with those of our own RAF, to see how effective they can be. Against a nation not provided on a lavish scale with bridging equipment, they would be far more effective than they were against us. Against such an enemy if he depended upon modern heavy tanks, they would be telling indeed. But demolitions must be carried out wholesale, on a wide front. In fact, to be useful, they require large numbers of trained personnel. It is true that, at the times when they might be called for, other work could be dropped. But demolitions do present a problem in training.

So much for a few of the tasks connected with actual operations. Unfortunately, in these days, these tasks are not necessarily the major part. As we have seen, the tremendously powerful mechanized modern army must have a really lavish organization to keep it going, and it is in the provision of this organization that so much engineering effort is nowadays required. I will try to run through these major jobs.

### Railways

First, and by far the most important, are the railways. It is often forgotten how entirely dependent we still are upon the railway, which has changed so little since it was first used in war in the last century by the Germans, Austrians, and French. As a mover of tons, it still has no equal, and it is probably true to say that the German defeat resulted as much

as anything from their short-sightedness in not making enough locomotives during the War and the immobilization of those they had by air bombing. I look upon the engineers' responsibility for building and operating railways as one of the most important of their duties. Of course, we obtain every scrap of assistance we can from the railway material and personnel we find in the country, and we are very dependent for British personnel upon the British railways. Experience has shown again and again that we must have a number of highly trained military railwaymen.

The railway problem in war is far bigger than many people think. The mileage of new permanent way required on the line of communications in the base, and especially inside base depots, is surprisingly great whatever the type of theater. And repairing demolitions is very heavy work. The difficulties and complications of forcing unusually heavy military traffic in unusual directions along unsuitable lines, often heavily damaged and badly maintained, produce real problems. We are so used to the reliability and comparative punctuality in our regular peace timetables that we are inclined to forget the different conditions of war. The different gauges alone may cause many a headache.

### Docks

Closely linked to the railways, and just as vital, are the docks, which provide for the whole operation of unloading ships and arranging that their cargoes are cleared by rail, road, or water. Dock reconstruction or construction may involve very heavy engineering and is always required at a speed unheard of in peacetime. It is pre-eminently an engineering problem.

We find it convenient in the British Army for the same corps to build and to operate docks, just as they build and operate railways. Operation of the cranes, the cargo handling gear, the lighters, and the stevedores is perhaps not strictly engineering, but we find it leads to smooth running. I also think it best for the engineers to run as we do the Inland Water Transport.

### Pipe Laying

Water supply has always been an important engineer function. Although we are now saved the major task of watering thirsty animals, there seems to be just as big a demand for water as there ever was. In the Middle East, we were filtering and piping around enough water for a city like Birmingham or Manchester and bored 20 miles of tube wells. Water, or rather the lack of it, of course, loomed very large in desert operations, and led to the laying of the 300-mile Libyan twin pipe line. Incidentally, it was used more for thirsty locomotives than for human throats.

This water line was followed by the laying of many gasoline pipes in all theaters, and these have no doubt become a permanent feature of mechanized war. The thousand miles of pipes working from tankers at the Normandy Beachhead and Cherbourg, and later from Ostend, to be supplied later still from *Pluto* at Boulogne, saved the 21st Army Group line of communications about 2,000 tons lift a day. The pipe line thus paid a handsome dividend. We shall, of course, improve the technique of pipe laying, which was restricted considerably by the type of pipes and pumps and tankage available at the time. With the far higher fuel consumption of modern fighter aircraft, there is no doubt that the pipe lines of the future will carry both gasoline and jet fuel.

### Maps

Air photography and radar have, of course, greatly simplified the making of maps. They have, so to speak, taken the drudgery out of the game by greatly quickening the mapping of topographical details and approximate contours. On the other hand, the engineers are still left with the

bulk of the trigonometrical and mathematical work, and we find that officers with engineer training are best for this. Although modern technique has reduced the work of map making, modern mobility and, of course, the range of modern aircraft, have enormously increased the area of the earth's surface for which maps may be required. Improvements in plotting and map reproduction have made it possible for up-to-date maps to be issued on a pretty lavish scale. In no theater, unless extremely close to home, is it possible to operate nowadays without a large map reproduction and distribution service involving large numbers of big modern lithograph and printing machines.

One other activity for which the engineers are responsible is movement control. Strictly speaking, of course, this is a non-engineer staff function, but we find that engineer officers, especially those with railway and docks experience, usefully fill a high proportion of movement control posts.

Also, the Army Postal Service has always been manned by the RE. This dates from the days when we ran the Signals.

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## Bacteriological Warfare

**Translated and digested by the MILITARY REVIEW from an article by Major Ernst Wiesmann in "Allgemeine Schweizerische Militarzeitschrift" (Switzerland) August 1949.**

WHEN and if bacteria are employed as combat means in total warfare, man and his domestic animals or plants will suffer a fatal blow. To be suitable for military purposes, however, microbes must fulfill a large number of conditions. For this reason, the different types that can be used are few in number. The following requirements are the most important:

1. The microbes must be "raised" and kept in readiness in large quantities.

2. The requirement, "kept in readiness," includes a certain degree of ability to survive on the part of the microscopic forms of life, even under unfavorable conditions.

3. It must be possible to bring the active agent into contact with the enemy in the proper form.

4. The incubation period of the disease that is to be induced must be as short as possible.

5. Pathogenic ability must be as great as possible. That is, all infected persons, if possible, must be made sick.

6. The sickness produced must come to a crisis as speedily as possible and must not be chronic.

7. The sickness produced must be as hard as possible to diagnose and its producer must be hard to determine.

8. Wherever possible, artificial immunization must not be possible and the producer should not respond to any specific chemical therapy.

9. It must be possible to immunize one's own forces against the sickness.

These requirements would seem to indicate that the possibilities of employing bacteriological warfare are rather limited. For example, requirements 1, 3, and 5 prevent the employment of the poliomyelitis virus; point 4 rules out the employment of the rabies virus, with an incubation period of 3 months, or of the tuberculosis bacillus; point 5 eliminates all producers of children's diseases; point 6 rules out tuberculosis bacillus or the producers of leprosy; point 8 eliminates the smallpox, tetanus, or diphtheria bacilli.

An attempt has always been made to associate bacteriological warfare with gas warfare, from the standpoint of their nature and employment. There is, however, a considerable difference between gas and

bacteriological warfare, mainly because of the contagiousness of the latter. In the employment of gas, only those who come in contact with the gas become sick. In the employment of bacteria, a single infected individual might transmit the disease to a large community.

### Usable Microorganisms

Microorganisms suitable for bacteriological warfare are listed in accordance with their method of infection as follows:

1. Contact infection. Here we may consider:

| | |
|---|---|
| a. Anthrax bacillus<br>b. Tetanus bacillus<br>c. Bacillus of gaseous gangrene. | Highly pathogenic for man and domestic animals. |

d. Strepto and straphylococcus.

e. Pathogenic fungi.

f. Brucella. Producers of Bang's disease in human beings and cattle (infectious abortion).

g. Tularemia bacilli. Producers of tularemia, a very contagious disease occurring chiefly in North America.

All of these germs are relatively resistant. Part of them occur normally in many places. Little is to be expected from this group. An intensive epidemic of anthrax would be a severe blow to an enemy, due to its effect on animals. It would not be of decisive influence, however, since it is possible to immunize against anthrax.

It seems that the disease-producers in this group might best be controlled by preventing sabotage, such as infecting bandaging materials or sterile medications intended for hypodermic injections.

2. Infections by means of intermediate hosts (insects). We may consider, here:

a. Yellow fever virus.

b. Dengue fever virus.

c. Malaria plasmodia.

d. The spirochete of relapsing fever.

e. Rickettsia.

This group differs from the first group only in that contact is brought about by an intermediate host. This group probably would not be of great importance since it is easy to break the chain of infection by destroying the intermediate hosts which are usually confined to limited geographical zones.

3. Infection by means of water and food substances. Here we have, mainly:

| | |
|---|---|
| a. Typhus and paratyphus bacilla.<br>b. Weil's leptospira. | Incubation period about 10 days; severe period of sickness of long duration; long period of convalescence. |

c. Enteritis producers. Short period of incubation; short period of sickness.

d. Cholera vibro. Short period of incubation.

e. Botulinus toxin. Short period of incubation; extreme intensity; usually fatal.

These producers of sickness are well suited for the infection of streams, reservoirs, and food supplies. If this could be successfully accomplished, considerable initial success would be attained in the infected area.

All the diseases of group 3 are diagnosed with relative ease by medical authorities. As a rule, determining the source of infection should not be too difficult. Further infection would then be avoided by adequate heating of all foods or beverages.

In a way, botulinus toxin presents unusual characteristics. It is one of the most powerful poisons known. Five one-hundredth of a milligram absorbed by the stomach or intestines is definitely fatal to a human being. The period of incubation is from 24 to 48 hours at most. Like most living producers of disease, this poison possesses low resistance. It is rendered inactive by short exposure to sunlight and other environmental factors, and it is completely destroyed by 2 minutes of continu-

ous heating at a temperature of 212° Fahrenheit.

As might be expected, the possibility always exists of increasing effects by employing a mixture of different germs or substances. In this case, the doctor or diagnostician would have much more difficulty in making a diagnosis and, consequently, in taking proper preventative measures.

4. Infection through the air. The greatest consideration should be given this group. since it possesses many and varied possibilities. The following diseases may be employed in this manner:

a. Anthrax bacilli.
b. Plague bacilli.
c. Glanders bacilli.
d. Tularemia.
e. Rickettsia.
f. Influenza virus.
g. Psitacosis virus.
h. Brucella.
i. Bacilli of haemorrhagic septicaemia Pasteurellia.
j. Foot and mouth disease virus.
k. Virus of equine encephalomyelitis.
l. Cattle-plague virus.
m. Hog-cholera virus.

It is obvious, of course, that considerable harm and losses could be caused by the concentrated employment of these disease producers. From the technical standpoint, the only question is how they might be employed.

To begin with, the microbes must be "raised" in large, special plants (analogous to munition plants) and produced in large quantities. From storage depots, they would be transported by the air force to the enemy's country and there sprayed over the intended areas. This could be done by attempting to unite the smallest of the microbes, especially the viruses, with fine particles of dust or water, and then dropping them in this form. An effort would be made to keep the microbes suspended in the air as long as possible and capable, even after having fallen to the ground, of being picked up again by the wind, to be drawn in with the breath. It goes without saying that weather conditions must be considered in a "bacteriological attack" by air. In moist air, such as fog, the microorganisms are able to remain in the atmosphere longer than in dry weather. Also, in damp weather, both human beings and animals are generally more susceptible to infection.

### Combating Germ Warfare

No realist will have faith in international agreements to outlaw the use of bacteria in war. Hence, the danger must be squarely faced and steps taken to meet i

Combating bacteriological warfare begins in the intelligence and espionage services. Wherever possible, it must be learned in advance whether certain nations are preparing for such warfare and what germs they plan to employ. On the basis of such findings, the medical service organizations must make proper preparations.

After hostile operations begin, steps must be taken to prevent the dropping of bacteria from the air, or at least to make such action difficult. These are tasks which can be fulfilled only by the general air defense. An adversary who possesses air superiority cannot be prevented from employing bacteria as a combat means.

After bacteria has been used in combat, there will be nothing else to do but to combat epidemics, just as in peacetime.

1. Prophylaxis. In addition to general hygienic measures which improve health and give the body the greatest possible resistance, specific immunization must be carried out. The troops, civilian population, and domestic animals must be made immune to those diseases or sicknesses against which reasonable protection by vaccination is possible.

The diseases against which satisfactory immunization is possible are few. The following requirements must be met before artificial immunizations are successful:

a. They must give sufficient protection.

b. They must be easily administered.

c. They must be safe.

d. All men and animals that might later become infected must be inoculated.

Since it will be impossible to protect ourselves against all eventualities, we shall of necessity be forced to count on early diagnosis of the diseases and must locate as soon as possible the source of the infection.

2. Diagnosis. It is extremely important to be able to discover and identify the producers of infection as early as possible. It would be well if this could be done before the occurrence of the first sickness. This will not be possible, however, in most cases. In all cases, the cause of a disease must be accurately determined. Only when we can identify an infection from the standpoint of its cause and ability to spread will we be able to combat it effectively and halt its progress.

The Americans have constructed a special device for detecting the presence of disease germs in the air. Large quantities of air are forced through a filter in the device. The germs are caught in the filter and subsequently identified.

The speediest possible diagnosis is essential. In virus diseases, especially, enormous and sometimes insuperable difficulties stand in the way.

Any attempt to establish schematic measures to be taken against epidemics will always be difficult. In fact, so many accompanying circumstances exert an influence that only a person who is well acquainted with the matter is able to proceed with any degree of success. Such a person constantly finds himself confronted with unusual situations, because, in the final analysis, he is fighting against a living agent. As everywhere, the problem to pick out the significant points from a host of equally striking ones and to make use of the correct and most effective measures at the right time and in the right place.

Even in time of war, it will usually be necessary to proceed as follows, in fighting infections:

a. The source of the infection must be eliminated.

b. The infectional chain must be broken at some accessible point.

c. When the measures indicated in a and b cannot be carried out, an attempt must be made to get away from the source of the infection. All sound individuals must be forced to leave the infected area.

d. Specific healing means must be made available.

e. As far as possible, steps must be taken toward immunization.

Hardly a single one of the above requirements can be satisfactorily met with respect to the pathogenic agents mentioned above. Where such infectious substances are extensively employed, considerable reaction must be expected. Even abandoning an area cannot be carried out easily. First, we do not know off-hand the extent of the area that is actually infected. Secondly, we do not know but that another and, perhaps, quite different germ is already present in the new area. Lastly, there always exists the great danger of spreading the germs through individuals who are infected but who have not yet become sick.

### Germs Against Plants

Since infectious diseases also occur in plants, the possibility exists of attacking edible plant life. Relatively little would be attained in warfare directed against plants, however, for the following reasons:

1. Epidemics among plants are much harder to induce than among animals.

2. Even under the most favorable ex-

ternal circumstances, the time required for the development of a great plant epidemic is much too long—at least 1 year—to be of decisive significance in war.

In new methods, however, we no longer have to employ living organisms. Instead, we use destructive chemical substances.

In the United States, several hundred different substances of vegetable hormone-like nature have been successfully created. Employed in small dosages, these substances promote the growth of plants. In larger dosages, however, they kill vegetable life and render it impossible for any vegetation to grow in the infected area for years. A certain amount of practical experience has been gained in the employment of these substances. Efforts have been made to produce substances for the extermination of weeds and the effects of these substances have been beyond all expectations.

These hormone-like substances could easily be sprayed by planes. Technically, it would be possible to render land areas as large as Western Europe or the Ukraine completely barren for years. Aside from an active air defense, we know of no specific means of combating this threat.

### Military Possibilities

From all this, it should be evident that it is impossible to conduct war with bacteria alone, and that germs in themselves are not decisive. Where forms of life are employed which are not capable of directing their own activity, since they have no will in the human sense, many imponderables enter into the picture. This being the case, bacteria can be used only as an accompanying weapon, but they should not be disregarded.

It is not entirely easy, even for one acquainted with the subject, to foresee clearly the methods of employment and the effects to be expected in a future conflict.

The method of conducting operations in a given theater is dependent, to a certain degree, on the goal to be attained. There should, nevertheless, be no doubt but that future wars will be total and three-dimensional. The so-called rear areas will be involved from the very outset, and it can well be imagined that the large centers of population will be attacked not only with explosives but also with disease germs. Under such conditions, epidemic substances will find particularly favorable soil. In addition, invisible forms of life possess the added advantage that it is difficult to prove their planned employment.

On the contrary, however, microbes will hardly be employed in ground fighting, or in mobile warfare conducted by ground forces as we have known it. Germs will be employed where it is desired to create prolonged and widespread panic and disorder, or where it is desired to bring about a climax.

### Summary

In preparing for bacteriological war, the following steps must be taken:

1. Teams and equipment must be ready that will permit rapid identification of germs.

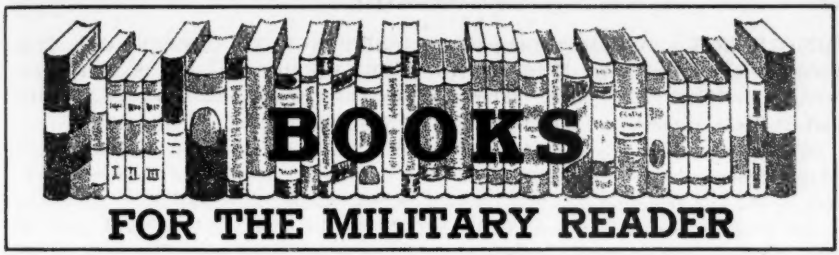
2. Immunizing and curative serum must be ready in such quantities that care for the army as well as the civilian population will be insured.

3. Specific remedies must be on hand in sufficient quantities.

4. Scientific instructions for the fastest possible suppression of an epidemic must be issued on its outbreak.

As in all war operations, the minimum of technical installations must be in existence. But in addition, the human mind must be armed and ready.

Even if pestilences break out and deaths multiply, we must fight all the harder. Persistence has always paid off. So far, every epidemic has sooner or later come to an end.




# FOR THE MILITARY READER

**THE SOVIET ECONOMY. A Selected Bibliography of Materials in English. By Harry Schwartz. 93 Pages. Syracuse University Press, Syracuse, N. Y. $2.25.**

This is a detailed guide to sources of material on Russia's economy. The author has divided his work into several convenient subjects, among them economic geography, economic plans and planning, industry, transportation, labor, and international economic relations. There is also a section on current research on the Soviet economy as of February 1949.

**MALARIA. The Biography of a Killer. By Dr. Leon J. Warshaw. 336 Pages. Rinehart & Company; New York, Toronto. $3.75.**

Although the soldier is often acutely aware of the deadly effects of malaria, the fact is not generally known that it is a disease that kills more human beings than any other. This book is a non-technical study of the history of the disease. The author considers it not essentially a medical problem today but a matter of grave concern to the statesman and economist. For the military reader, there are numerous references to historical incidents when malaria influenced the conduct of military operations. One chapter recounts Gorgas' battle with the disease in Panama. A section deals with malaria in war, particularly in Macedonia in 1917 and during World War II. "The Japanese attack on Pearl Harbor," the author reports, "found the United States singularly unprepared to meet the threat of malaria."

**GLOBAL MISSION. By General of the Air Force H. H. Arnold. 626 Pages. Harper and Brothers, New York. $5.00.**

*Global Mission* combines in one volume the coming of age of American air power, the conduct of World War II from the topside, and the personal recollections of one of America's foremost military leaders. General Arnold's own air experience spans the entire period of the air age; he learned to fly under the instruction of the Wright brothers, and in World War II he commanded the greatest air force in history. He records the long struggle of the air arm for recognition; of General Marshall's influence in this respect, he says, "It is hard to think how there could have been any American Air Force in World War II without him." As a member of the Combined Chiefs and Joint Chiefs of Staff—Arnold is the first to write an account of his experiences—he gives important sidelights on the general conduct of World War II as well as on the vital role which air power played in that conflict. All this, in addition to a rich fund of anecdote, makes *Global Mission* an important addition to the growing list of books on World War II.

**THE AMERICAS. The Search for Hemisphere Security. By Laurence Duggan. 242 Pages. Henry Holt & Co., New York. $3.00.**

**THE STATE OF EUROPE. By Howard K. Smith. 408 Pages. Alfred A. Knopf, New York. $3.75.**

**THE OLD BREED. A History of the First Marine Division in World War II. By George McMillan. 483 Pages. Infantry Journal Press, Washington, D.C. $6.50.**

Here is a readable history of the 1st Marine Division, combining solid history with legend and reminiscence. The record of the Division covers some of the most bitter fighting in the Pacific during the War—Guadalcanal, Cape Gloucester, Peleliu, Okinawa. Nineteen Medals of Honor were awarded to members of the Division for valor in these campaigns. The volume is profusely illustrated with photographs and maps.

**UNITED STATES ARMY IN THE WORLD WAR, 1917-1919. Vol 4, Early Military Operations of the American Expeditionary Forces. By the Historical Division, Department of the Army. 806 Pages. US Government Printing Office, Washington. $3.75.**

The Historical Division continues its publication of the documentary records of World War I with this volume covering the first combat operations of US troops in 1918. Despite General Pershing's continuing determination to have the American troops employed as a unit, they were placed at General Foch's disposal without reservation to meet the early German offensive of 1918. Most of the Americans in the Somme and Lys defensives were engineers employed as infantrymen. The volume tells of the 3d Division action at Chateau-Thierry and the 2d Division operation on the Chateau-Thierry—Paris road and at Belleau Wood. At Catigny, the 1st Division was the first American division that fought as a unit in an offensive operation.

**U.S.A.: MEASURE OF A NATION. A Graphic Presentation of America's Needs and Resources. By Thomas R. Carskadon and Rudolf Modley. 101 Pages. The Macmillan Company, New York. $1.00.**

**ASSISTANCE TO GREECE AND TURKEY. The Department of State, US Government Printing Office, Washington, D.C.**

This is a series of quarterly reports by the State Department on expenditures and activities in Greece and Turkey. There is considerable information on the operation of the Greek Army, Navy, and Air Force against the guerrillas, and on the general military situation. In Turkey, the assistance program has largely been concerned with training and modernizing the military forces. The eighth report was for the period ending 30 June 1949.

**CUSTOMS OF THE SERVICES. By Group Captain A. H. Stradling. 91 Pages. Gale & Polden, Ltd., Aldershot. 75 cents.**

A book that should prove helpful to all United States officers serving in England or elsewhere where they may have frequent contact with British forces is Group Captain Stradling's *Customs of the Services.* Originally written for the Royal Air Force, a new edition issued in 1948 has been expanded to include all three British defense services.

**INFANTRY BRIGADIER (The Story of New Zealanders in the Eighth Army) By Major General Sir Howard Kippenberger. 371 Pages. Oxford University Press, New York. $4.75.**

**ANTARCTIC CONQUEST. By Commander Finn Ronne, USNR. 299 Pages. G. P. Putnam's Sons, New York. $5.00.**

**CONQUEST OF SPACE. By Bonestell and Ley. 160 Pages. Viking Press, New York. $3.95.**

**THE JUNGLE IS NEUTRAL. By F. Spencer Chapman. W. W. Norton & Co. $3.75.**

**THE STORY OF LANGUAGE. By Mario Pei. 493 Pages. J. B. Lippincott Company, Philadelphia. $5.00.**